

Greenville Yard
Upper New York Bay
Jersey City
Hudson County
New Jersey

HAER No. NJ-49

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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
MID-ATLANTIC REGION NATIONAL PARK SERVICE
DEPARTMENT OF THE INTERIOR
PHILADELPHIA, PENNSYLVANIA 19106

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HISTORIC AMERICAN ENGINEERING RECORD

GREENVILLE YARD

HAER No. NJ-49

Location: Upper New York Bay, Jersey City, Hudson County,
New Jersey

Date of Construction: 1900-1916

Present Owner: Port Authority of New York and New Jersey

Present Use: Vacant

Significance: The Greenville Yard is a unique combination of a large classification rail yard with support facilities, and marine operations. Designed and built at the beginning of the twentieth century, it was planned to facilitate the flow of freight through and around the greater New York harbor in the era before the motor truck became significant. The strategic location, large storage and sorting capacity (7,000 cars), flexibility of design, hard work and adaptable use of available equipment by the crews employed at the Greenville Yard made it a major component in freight movement in the harbor from 1905-1906, when it became operational, until the late 1970's. The yard remained in operation long after most other rail lighterage and marine transfer facilities had closed, and two of the original transfer bridges are still in operation at this time.

Elements which make this yard unusual, besides overall size and design, are the six carfloat transfer bridges (not included in this study), and four snap-boom gantry cranes on the open pier. These date from the beginnings of the yard (1905-1916) and were significant innovations in the technology of their day. Also of note are the covered pier (built circa 1916), the coal hopper (built in 1939-1941), the marginal crane (moved to the Greenville Yard in 1941-1942), and yard operations.

Project Information: In December 1981 the Port Authority of New York and New Jersey acquired the Greenville Yard, a property which had been determined eligible for the National Register of Historic Places. The Port Authority voluntarily initiated recording of the yard for the Historic American Engineering Record. Dr. Susan Kardas and Dr. Edward Larrabee of Historic Sites Research, Princeton, New Jersey, completed this documentation in June 1983.

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CHAPTER 1

PURPOSE OF STUDY

The following document is prepared to satisfy the requirement of producing an archival recording of the Greenville Yard at Jersey City, New Jersey for the Port Department of the Port Authority of New York and New Jersey.

The Port Authority is the owner of the major portion of the Greenville Yard, which it acquired in December 1981. This holding and its relationship to the railyard is shown in Figure 1. Upon the initiative of the U.S. Army Corps of Engineers, and with the endorsement of the New Jersey State Historic Preservation Officer, the Greenville Yard Pier area was determined eligible for listing in the National Register of Historic Places, September 1981. This initiative was undertaken by the New York District Corps of Engineers as a result of their "New York Harbor Collection and Removal of Drift Project", a Federal project involving the removal or repair of derelict waterfront structures and vessels in the Port of New York and New Jersey. The request for determination was submitted on August 19, 1981.

The key water-front structures that are part of the Greenville Yard are : a coal hopper, a covered pier, an open pier and cranes thereon, a car-float bridge complex, and an ice jetty. The latter two structures are not located on the property acquired by the Port Authority. Figure 1 also shows the National Register property boundaries.

The Port Authority wishes to have the property available for marine or industrial development purposes. Such development could require the partial or total removal of the waterfront structures on Port Authority property. Accordingly, because of the historical significance of the waterfront structures as established by the "eligibility determination", the Port Authority is interested in voluntarily undertaking archival recording of the structures, equipment, property and functioning of the Greenville Yard.

According to the requirements set forth in the Scope of Work authorized by the Port Authority, the work shall include historic research on the development, ownership, use, and significance of the property, structures and equipment, together with necessary illustrative photographs, maps and drawings. Emphasis is placed on how the Greenville Yard and its components functioned in an integrated manner, rather than on great detail concerning the individual components. Accordingly, interviews with railroad employees and other persons familiar with the history, development, and use of the property are included. Schematic drawings and copies of original drawings are preferred over detailed measured drawings. Photographic recording of current conditions and available historic photographs are included. The archival recording is being undertaken in a manner that will meet the requirements of the Historic American Engineering Record and is being coordinated with the New Jersey State Historic Preservation Officer, the U.S. the Department of the Interior, the New York District of the Corps of Engineers, and the Port Authority of New York and New Jersey.

CHAPTER II

METHODOLOGY

There were three major aspects to the preparation of this study. One was the collection of archival data and railroad records which relate to the Greenville Yard. Each request for information had to be preceded by an official letter from the Port Authority. Railroad personnel in many departments generously shared their records with us. Materials were examined in Philadelphia at the CONRAIL offices, and at Penn Station in Manhattan at the AMTRAK offices.

Old records were stored in an unused drafting room at Penn Station. Unfortunately, within the last year, the room in which this archival treasure trove was stored was fire damaged, and there now exists only one case of drawings and miscellaneous materials salvaged from the fire. From this last collection have come most of the maps and plans that make documentation of the yard possible. We also had the opportunity to visit what remains of the Greenville Yard records once stored in the upper office space in the Covered Pier. This material was abandoned on April 15, 1976, and in the ensuing seven years has become disarrayed. Miraculously, this material has not been burnt, hauled away or completely destroyed; however, it has been vandalized, rain soaked, and become the home of vermin. Here lie the employee records, shipping records, and operational procedures. Salvage of these data is unlikely given the volume and condition, but we were able to locate a few key records with the aid of three flashlights, intrepid anthropologists and a Siberian Husky.

Besides the railroad records, we perused histories of Jersey City, newspaper records, technical documents relating to railroad and engineering records, and port-related documents in the excellent Port Authority of New York and New Jersey library. This was used to expand the data collected in 1978 and 1979 for the Corps of Engineers reports on Greenville Yard.

The second major aspect was to interview as many persons as possible who were knowledgeable about the way the yard had worked and who had played a role in it. These individuals are listed in a separate appendix of the report and their recollections are discussed in Chapter VI.

Lastly, we photographed and studied the physical aspects of the yard (described in Chapter V).

CHAPTER III.

CONSTRUCTION AND EARLY DEVELOPMENT OF THE GREENVILLE YARD

A. Rail Freight Traffic and Lighterage at the Beginning of the 20th Century.

The Port of New York and New Jersey is a two-way gateway through which flows a tremendous volume of the Nation's exports and imports. At the end of the 19th Century, this Port, which includes the cities of Jersey City and Bayonne in its Customs District, was becoming the greatest seaport in the world, rivaling the Port of London in tonnage shipped. Through the port moved goods and produce from all over the United States, as well as imports from foreign markets. The systems which supported this commerce were the railroads which brought goods to the port and transported foreign products for interior distribution. The railroad facilities which made this commerce possible were, by the end of the 19th Century, concentrated along the western shore of Upper New York Bay, extending from the Palisades of the Hudson River southwestwardly to the mouth of the Kill Van Kull.

In the Colonial Period, port activity, like most industries, began by being highly localized. Manhattan served the immediate vicinity and the Hudson Valley. This pattern persisted until the first half of the 19th Century, at which time imports and exports became concentrated at a few seaports, most notably to the Port of New York. In 1790, this port handled only 5.7 per cent of the value of the nation's foreign trade, by 1830, 37 per cent, and by 1870, 57 per cent (Chinitz 1960: 8-9). This centralization was the result of vast improvements for transport of goods through the interior United States. Canals crossed New York State, Penn-

sylvania, New Jersey, Ohio and Illinois providing cheap water transportation. Surface roads increased from 9,600 miles in 1820 to 71,000 miles by 1850. Railroad freight did not exist before 1830, but in the the next thirty years had developed over 30,000 miles of track. Land transportation rates dropped radically, and ships' cargo capacities increased, making exportation economical on a scale it had never been before (Chinitz 1960: 10-20).

To understand the historical role of the Greenville Yard, and other metropolitan freight complexes (see Figure 2) in this time of tremendous growth, one must first understand some of the geographical and technological limitations of rail freight at the end of the 19th century. The problem faced by the commerce and transportation system in the metropolitan area at the beginning of the 20th Century was that there was no simple way of transferring the immense quantity of freight arriving from the interior of the continent directly onto ocean-going vessels or of bringing it directly into Manhattan. Most freight moved by railroad, and the only direct rail lines into New York City came from the north. Even these served mainly to bring passenger traffic to Grand Central Station, rather than to transport volumes of freight for shipping. The Upper New York Bay shoreline of Jersey City and Bayonne was the best area where the rail lines from the west could locate their freight terminals, and marine operations were the only way of moving this freight to New York City or onto ships for foreign commerce.

1. The Choice of Freight Yard Locations

At this time one of New Jersey's most valuable assets in terms of commercial development was the tract of riparian lands fronting the westerly shore of Upper New York Bay extending from the Palisades of the Hudson River southwestwardly to the mouth of the Kill van Kull. This was viewed by some as the most important entrepreneurial opportunity of the time, and ideally suitable for rail yard expansion. Currie, writing in 1906, eloquently describes the phenomena of the railroads on the Port of New York shore. The "greatest freight terminal in the world" mentioned below is the Greenville Yard then under construction.

A glance at the map will show its magnificent situation for the future commerce of the continent. Here the railroads from the West and all portions of this great country will meet the steamships from many climes. Most of this territory is still virgin soil, scarcely scratched by the hand of commerce, but large portions are now being developed and made available for the accommodation of tremendous enterprises...The great Pennsylvania railroad with its constantly growing business having exhausted all the available space at its immense water frontage on the Hudson River, determined to locate on New York Bay near the southerly boundary line of Jersey City what will be when completed the greatest freight terminal in the world. Already this corporation has reclaimed two hundred acres of land at an expense of several millions of dollars. When the improvement is completed it will have cost many millions more. The enterprise involves not only the reclamation of the two hundred acres of land mentioned but one hundred acres additional; also the dredging of channels from the bulkhead out to the deep water of the bay, the erection of warehouses for the storage of commodities and the building of docks and piers to facilitate the transshipping of goods and produce at tide water.... To any line of railroad seeking an outlet from the west to tide water in the port of New York this point affords the easiest approach because of the natural topography of the upland lying to the west between Newark bay and New York bay. There is no other land in this vicinity with so low an elevation or where the distance across is so short as at this point on this whole peninsula lying between the two bays and on which is located the southern part of Jersey City and Bayonne. This condition

insures a practicable grade for any railroad seeking a terminal on New York bay. In addition, few buildings have yet been erected here, while a short distance from it, north and south, the territory is well covered with many dwellings.

The improvement of this property by the proper construction of docks, piers, warehouses, dry docks, and grain elevators would furnish desirable facilities for

the receipt of cargoes from ships, their temporary storage, their transshipment to railroad cars or vessels and prompt dispatch to ultimate destination: also for the receipt and storage of grain, cotton, tobacco, naval stores, meat and other domestic products coming from the western states by railroads and awaiting shipment to foreign countries.... The cities of Jersey City and Bayonne are included in the customs district of the port of New York. From seventy to ninety per cent of the wholesale business of New York is done with the country west of the Hudson river and New York bay. This large percentage comes through Hudson county to tidewater and has made Jersey City the railroad center of the east and of the country. It is really the gateway to and from the continent through which passes in both directions countless commodities of all descriptions (Currie in Meeker 1906).

2. The Technology of Freight Transfer in the Early 20th Century

Prior to 1866, the only way goods could be transported from ship to railroad system and vice versa was by a maritime link between freight yard and sea-going vessel. This was originally performed by lighter and ferry-boat which loaded and unloaded small cargo loads from each kind of transport.

In 1866, this system was greatly enhanced by the development of the carfloat. A carfloat is simply a large scow-hulled vessel with two or three tracks on it. At the rail terminals the cars are switched onto the float over float bridges or transfer bridges consisting of movable aprons supported by over-head framework and capable of being adjusted to varying elevations as the tide rises or falls, or the float sinks lower in the water. The equipment had changed since 1866, but not the method. The car float equipment at the Greenville Yard was built in 1904 -'05 as a three bay structure. This equipment is still in use in 1983, although the structure is falling into disrepair. Its primary purpose is to move freight for local consumption into Brooklyn.

Lighterage is characteristic of the Port of New York and New Jersey. It involves the loading, unloading or transportation of goods by means of a "lighter" (a large, usually flat-bottomed boat or barge) across water. It was neither practical or economical for the early railroad operators to consider tunnels, bridges or water front belt lines. At first the service was simply across the Hudson River, but as shipping and industry spread over into Brooklyn lighterage activity expanded. Within this area the lighter functions as a water truck or as a box car continuing its movement over a water belt line; the tug performs as a locomotive

in switching between the rail terminals and the steamship piers (The Industrial Museum of New York, 1930: 9-10). Freight for local consumption is delivered by railroad cars on car floats, whereas export freight is unloaded at the railroad terminals into barges or lighters which in turn are towed along side the steamships or their piers.

It was not until 1910 that an all rail tunnel entrance for passenger trains into Manhattan was completed; and the Hell Gate Bridge, opened in 1916, provided the first all rail outlet from Long Island to New England. It was anticipated as early as 1930 that some day a tunnel from Jersey City to South Brooklyn would replace the carfloat service for freight (The Industrial Museum of New York, 1930: 8); however, this has never been achieved.

After the introduction of the carfloat in 1866, there was no substantial change in the method of handling railroad freight until the advent of the motor truck in about 1920. This pre-motor truck era was the level of technological efficiency for which the Greenville Yard was designed.

B. Construction of the Greenville Yard

1. Chronology

The Greenville Yard was part of the great expansion of freight handling facilities in the Port of New York, constructed during the great period of national rail expansion extending from the end of the Civil War to the beginning of the 20th Century. The land upon which the Yard was built was created by the Pennsylvania Railroad between 1900 and 1910, by filling shallow tidal marsh along Upper New York Bay using as landfill rock coming from the excavation of the North River Tunnel and excavations in Manhattan for the Pennsylvania Station and its related extensive rail yards (Kardas and Larrabee 1978: 56-57, 91-95, 1979:3). Work on this project began in March of 1900, at which time the facility was known as the "New York Bay Railroad Yards." The original filling began in the southern section of the yard which contained 12,000,000 cubic yards of material by 1905. An additional 8,000,000 cubic yards were estimated as required to complete the northern end of the yard (Pennsylvania Railroad 1900, 1902, 1904, 1905, 1906, 1907, Railway Age 1905: 402, Burgess & Kennedy 1949: 500-501). An examination of Sanborn Insurance Atlas maps covering the Greenville Yard indicates that there have been no major changes to the shoreline since the yard's completion in circa 1912, although there has been alteration to the piers and facilities of the yard continuing up to the present.

Made-land in the southern portion of the yards, where 12,000,000 cubic yards were reported in place by 1905, must have reached its present eastern terminus by at least 1904, because

the first three car float bridges were constructed in 1904 and 1905, presumably requiring a firm foundation on fill which had already settled and stabilized. The first map which shows the yard in detail was made in 1911, and shows the entire yard filled to its eastern limit, and as far north as the north side of the three transfer bridges. A portion of the 12,000,000 cubic yards placed here came from the enormous excavation carried out between 1903 and 1910 for the Pennsylvania Railroad's New York Station project which included 14 miles of tunnels and cuts, and removed about 7,000,000 cubic yards of spoil (Condit 1980: 295-308, 385, 392). Present by 1911 were the three transfer bridges, the Open Pier (Pier B) and the Coal Pier (Pier D; see Figure 4).

In 1912 fill had been added north of the bridges, creating a "scow" slip (Sanborn 1912, Index Sheet and Volume 9, Sheet 92, see Figure 5). No new piers are shown, except for a small jetty immediately north of the transfer bridges (see Figure 5a). No tracks had yet been laid on the new made-land in the north part of the yard, but a complex rail yard pattern was already present in what is now the southern two-thirds of the yard.

An undated large scale ink on linen plan of the yard shows a stage of development when the northern part of the yard was filled to its present limit, but only a few tracks had been laid on it (Westward Make-Up Tracks). Evidently surcharge was still present on the recently deposited fill along the north side of the yard, where three contoured mounds are shown labelled "Stone Pile ap. 20' high ...25' high ...30' high". The Morris Canal is shown in operating condition which dates this drawing to before

1920, by which time the canal was abandoned. On Newark Bay the Pierhead and Bulkhead Line Sept. 13, 1913 is shown, with the date Nov. 1916 penciled over. This internal evidence suggests that the plan was drawn after 1913, but before 1917. This updated map is considered an accurate representation of the situation between 1913 and 1916. It may be a draft for the complete survey of railroad property required by the Interstate Commerce Commission in 1917 (T.O.'Dwyer). The original plan is at a scale of 1 inch equals 100 feet, and is about 20 feet long. Selected portions are reproduced as Figures 6 - 9.

This 1913-1916 map shows the Covered Lighterage Pier (Pier C) which was described as "now being built " in 1916, as completed and covered with a structure (Cresson 1916: 33). A fourth car float loading bridge had been added, evidently at the south end of the group, because the space between the bridges and Pier B had become smaller, while the protective jetty and slip are still unchanged at the north end of the group. The three original bridges were numbered 11 through 13, and the new one was No. 14 (see Figures 6 and 7).

Four " Traveling Cranes 10 Ton Capacity" are indicated on the Lighterage Pier (Pier B). The Power House had been present since at least 1912 and it is reasonable to assume that it must have been completed at the same time as Car Float Bridges No. 11 - 13 to provide the power to make them operational by 1905. This Power House also provided electric power for the cranes. Cranes No. 1 through 3 on the Open Pier were designed in 1904 (C.W.Hunt Co. Drawings, see Figures 10 and 11)*and presumably manufactured about that same time. Crane No. 4 is a 20 ton capacity crane,

*Photographs NJ-49-17 and NJ-49-18

reportedly built in 1920 (J. Findley and T. Walsh) but that information may place it too late, as this 1913-1916 plan shows four cranes in place (see Figures 6 and 8).

Also shown in detail on the 1913-1916 Plan are a Coaling Pier, consisting of four tracks with 12 coal chutes on a projecting pier, upon which coal cars were placed by means of an overhead trestle. A Car Repair Yard containing a Mill and Office, Carpenter Shop and Blacksmith Shop and five smaller shops and buildings were immediately west of the Power House, and various support or service structures such as a Restaurant, Union Building, and a Plumber Shop were in the general vicinity of the Power House and Transfer Bridges. Further west in the yard were small clusters of structures in the Steel Storage Yard and around the Ice House. There was an Engine House and related structures west of the Morris Canal. This was a one quarter roundhouse with 11 bays and a turntable (see Figures 6 & 9).

The next detailed depiction is a Pier Map of 1928, which confirms most of the items shown in detail on the 1913-1916 map, including the presence of a raised trestle enabling coal cars to reach the Coal Pier (see Figure 12). Shortly after that plan was made a long thin jetty was built in 1928, extending into the northeast corner of the yard, with the "Tail Track" on it. The Tail Track was used for final makeup of westbound trains, the units of which had been assembled in the westbound yard.

A major renovation occurred between about 1939 and 1942, possibly prompted by increased harbor activity during the early stages of World War II in Europe. A set of plans dated 1939 to

1941 show the new Coaling Station (a steel hopper on a concrete dock) which was built at that time, replacing the old raised trestle Coal Pier. This 680 ton coaling station is the steel structure now standing derelict south of the Covered Pier (see Figure 13)* The index cards on file in the Pennsylvania Railroad New Jersey Division's draughting records in Penn Station contain many references to revisions and proposals in this time period. Among them was the installation of the Marginal Crane which was brought to Greenville from Manhattan in 1941 and 1942. After the war, in 1954, a new yardmaster's office was built. This appears to be the last major construction or addition at the Greenville Yard and marks the end of its period of expansion.

A schematic diagram of rail layout and capacity was made in 1942 and was updated to 1962. The update refers only to changes in rail lines and yard capacity, so all structures shown were present by the beginning of World War II (see Figure 14). At that time the yard had reached its maximum development with extension of rail yards in the northern portion. The last two car float transfer bridges (Nos. 9 and 10) had been added at the north end of the group, and the scow slip filled in. A new jetty built north of the transfer bridge No. 9, and the even longer jetty, built in 1928 with the Tail Track on it is shown on Figure 14. The chronological information on the growth of the Greenville Yard is summarized in tabular form on the following page.

*Photograph NJ-49-19

TABLE OF CHRONOLOGICAL DEVELOPMENT OF THE GREENVILLE YARD

- 1900 Construction begins with placement of heavy rock landfill.
- 1903-04 Fill extended to the east end of the yard, north side incomplete.
- 1905 12,000,000 cubic yards of landfill are in place.
- 1904-05 3 carfloat bridges (Nos. 11, 12, 13) are built, 3 cranes on Open Pier.
- 1911 Open Pier B, Trestle-style Coal Pier, & Carfloat Bridges present.
- 1912 Additional fill added completing yard to the north.
- 1916 Covered Pier C under construction.
- 1913-1916 Covered Pier C present (one story) and 4th carfloat bridge (No. 14). Four cranes are indicated on Open Pier B.
- 1920 Crane 4 on Open Pier B (maybe one of four cranes 1916)
- 1928 Covered Pier C has present structure.
- 1928 Tail Track built.
- 1939-40 Trestle-style Coal Pier replaced with existing Coaling Station (steel hopper on concrete dock).
- 1941-42 Marginal Crane moved to Greenville from Manhattan
- 1942 5th and 6th carfloat bridges (Nos. 9 & 10) present. Full development of yard complete. Two story office building built inside Covered Pier.
- 1954 New Yardmaster's Office built at west end, replacing earlier structure.

2. Method of Construction

In 1916 a study was prepared for the New Jersey State Board of Commerce and Navigation and the City of Bayonne, for a proposed Marine Terminal in Bayonne, immediately south of the Greenville Yard on the same waterfront. B. F. Cresson, the Supervising Engineer, examined and described in detail eight docks then proposed, under construction, or recently built in the New York Harbor area, one of which was the Pennsylvania Railroad Pier at Greenville, N.J. (Cresson 1916: 33-34). The latter was described as "low grade type construction...now being built...with a length of 1,020 feet and width of 200 feet. The interior or filled in portion proper is retained in place by riprap embankments covered with cellar dirt. The cellar dirt is used for filling in the crevices amongst stone to prevent and retard the percolation of sand filling through the riprap embankment".

The dimensions make it clear that this described the soil core of the the Covered Pier (Pier C). This core was about 130 feet wide, and "platforms" supported by vertical piles spaced 5 feet apart extended 34 feet on each side of the core. The platforms were faced with concrete walls, and a floor made of 6 inch by 12 inch creosoted yellow pine, covered with "master builders' compound" (concrete with iron in the mixture). It was reported that "this type of pier is admirably adapted for the construction of foundations for the subsequent sheds and buildings that may be built", and that "within the limits of reasonable cost" this is "one of the best types of filled-in piers". The only weakness was considered the potential for "sloughing

off" at the toe of the riprap embankment, especially when future dredging occurred to maintain the wharfage depth of 30 feet at mean low water (Cresson 1916: 33-34).

From this document it appears that Pier C was being built in 1915 or 1916, and did not yet have a superstructure. The central portion had a core of heavy stone, packed and covered with cellar dirt (waste material produced by clearing a construction site of an existing building, J.Gell Dec. 14, 1982). It is assumed that a similiar technique, simplified and adapted to the enormous volume of fill concerned, was used to make the massive landfill for the Greenville Yard proper from which Pier C extended.

The surface layer of fill in most of the railyard is a combination of cinder, clinker, ash and road-bed gravel, which is typical of railroad facilities constructed during the era when great quantities of coal were consumed by the railroads. It is reported that in recent years there was a persistant low grade underground fire near the west end of the yard, when unburned coal in this mix caught fire and could not be extinguished (J. McLaughlin).

The numerous drawings on file in Penn Station indicate that there were frequent alterations of specific track layout, and that this occasionally included some revision to grades, so that portions of the Eastward or Westward Humps were regraded. Aside from such minor changes in surface elevation, and numerous variations on track configuration, there has been no substantial change to the mass of made land since the filling for the yard was completed in the second decade of this century.

CHAPTER IV

GREENVILLE YARD LAYOUT AND OPERATIONS

Although there is a wealth of information about the role of the railroad industry in transportation history and architectural surveys and treatises regarding passenger terminals and other miscellaneous structures, little formal analysis has been devoted to the freight yard, of which Greenville Yard is an example. Yards are perceived as "places where goods are transferred or stored", and tend to be treated as consisting of elements rather than viewed as an interrelated complex, which they must be in order to achieve the ends for which they are designed.

The railroad yard plays an important role in the handling and distributing of traffic at leading terminal points. However because the movement of the goods tends to be the focal point of interest, the significance of the yard facility is often underestimated. An enlightening description of a railroad yard is provided by J. L. Ringwalt near the end of the 19th century:

The multiplicity of tracks, frequently extending over a considerable distance, affords facilities for promptly assorting cars conveying different classes of merchandises or destined to different points, and thus separating and remaking up trains. This work requires an immense amount of space, a great deal of switching, or moving cars from one train or place to another. An idea of the magnitude of yards and yard room and the length of the tracks they contain is furnished by the statement that in 1884 there were in the yards of the railways radiating from Buffalo 436.10 miles of track.

The practice of different companies varies considerably in the extent to which reliance is placed upon yards chiefly or almost exclusively for the resorting and distribution of freight, in contradistinction to completeness of supplementary arrangements for different classes of traffic - but all important companies use yards very extensively, and labors in them form such an important portion of railway transportation that it has been referred to as a work divided into two general heads, one of which consists of work on the road and the other of work at division and station yards.

Different portions of the yards or distinct yards are set apart for special purposes, indicated by such titles as oil yard, coal yard, east-bound yard, west-bound yard, grain yard, empty yard, passenger yard, fast freight yard, receiving yard, etc. It is in these yards, mainly, that trains are broken up and arrangements made for sending each car to an appropriate destination and that trains are made up of the particular cars that form them (1888: 308-309).

The Greenville Yard was both an extremely large rail facility and an unusually complete one. A former trainmaster said that it was the "only railroad facility where I ever worked that had every phase of railroading that existed. There was lighterage, car float loading, freight sidings, icing, repair - even grain - the elevator was east of Siberia" (J. Schrippia). In the view of an experienced railroad official, Greenville was "one of the most flexible yards in the entire system" (J. McLaughlin). The Greenville Yard can be discussed as composed of two major types of components. One of these is the Switch Yard which consists of all the land tracks and facilities, and the other is the Maritime Operations involving the piers and land to water transfers.

A. The Switch Yard

Our research has not produced any written description which includes all of the elements which make up the Greenville Yard, and in order to better understand this facility we have generated a list of components based on a detailed drawing of the yard made in May 1942 (See Figure 14, which represents the Yard at its maximum capacity). The Switch Yard consists of all the yard west of the waterfront, and consisted of numerous Track Yards as listed below. Note that more track yardage is required in the Westward Yards than in the Eastward Yards because the primary operation of the Westward Yard involves creating trains destined for points all over the western continent. The eastbound trains have already been assembled and are reaching their final destination.

Westward Yards

Westward Make-Up Yard
Westward Receiving Yard
Westward Classification Yard
Westward Preference Yard
Westward Lighterage Yard
 Loop Yard
 Working Yard
 Covered Pier Yard
 Coal Yard

Eastward Yards

Eastward Yards
(A,B,D,E,F,G)

Other elements include:

Grain Yard
Upper and Lower Steel Storage Yards
"Siberia Steel Storage Yard"
Car Repair Yard
Ice House Yard

The few structures scattered throughout the yard are: the Yard Office, Arriving Freight Train Master & Yard Master Office, Icing Plant, Water Tank, Yard Office, Power Plant, Cranes (in Steel Yards), and Grain Elevator.

It is clear from the orientation of the tracks that this facility is designed with one function in mind; that of moving goods in and out of the New York Harbor metropolitan area in eastbound or westbound directions. The links of the yard are not local, i.e., this is not a terminus for Jersey City/Greenville, but links producers in the "West" with consumers in New York City, Long Island and New England, and vice versa. The yard itself cannot be conceived of simply as ending with the transfer bridges and open dock, but is a vital link in a system of maritime transfer of rail shipped goods via lighterage and carfloatage through the Port of New York.

In the 1950's and 1960's the Switch Yard was worked by 11 train crews (55 men) on the day shift (7AM - 4 PM), 9 crews (45 men) on the evening shift (3 PM -midnight) and 6 crews (30 men) on the night shift. Crews consisted of 5 men each (Engineer, Fireman, Conductor, and 2 Brakemen). In addition, up to 25 men worked in the Westward Yards, and 15 in the Eastward Yards. These were Fieldmen or Hump Crew, who would ride cars and break them off. Smaller crews handled eastbound freight which was transported by lighterage or sent directly to the transfer bridges and did not require as much switching. Westbound freight had to be completely sorted before trains were made up because this was the point from which westbound trains originated.

In addition to these Switch Yard employees, there were men working at the Grain Elevator, the Ice House Yard, and the Car Repair Yards. All the train crews and movements were controlled by a Trainmaster and a Yardmaster.

Steel Storage Yards occupied the entire southern part of the Greenville Yard, because of the space required for large structural elements. Both railroad employees and outside crews worked here. The westernmost of the three Steel Storage Yards was considered so isolated and undesirable that it was referred to as "Siberia" on company maps. Steel was brought to the Greenville Yard by rail and then transported to such construction projects as the George Washington Bridge (1931), the Bruckner Boulevard Expressway, the Newark Bay and Hudson County extension of the New Jersey Turnpike (1955) and the World Trade Center (1968-1971). Units for the construction of the Verrazano-Narrows Bridge (1961-1964), each 80 feet long by 40 feet high and weighing 256 tons, were assembled in the Lower Steel Yard and then skidded on a concrete pad to lighters which floated the units to the bridge site.

In the 1940's through 1960's there were as many as 7 locomotive cranes on the rails of the Steel Storage Yards, and a larger 40 to 45 ton capacity fixed crane on the southern edge of the yard. This crane, referred to as the Marginal, Whirler or Whirly Crane (because it was in a fixed position at the margin of the yard, and could rotate 360 degrees), was moved to the Greenville Yard in 1941 from the Transit Mix plant at 23rd Street on the East River. During World War II it was used to load Sherman Tanks.

Bypass lines known as "Broadway", the "Westbound Speedway", and the "Monkey Run," allowed equipment to move from one part of the yard to another. Travel from north to south was especially complicated in this yard where the major flow of traffic was designed to go east and west, but where the width of the facility and the different services scattered over the area required that equipment might have to go from the Grain Yard on the south edge to the Paint Track of the Car Repair Yard on the north edge, a distance of more than half a mile in a straight line, but reached only by switching back and forth across the prevailing direction of track.

One particularly important function was provided in the Ice House Yard, where perishable produce brought from west of the metropolitan area was re-iced before being transferred to car floats or broken down for lighterage. This area was placed to one side of the Eastward A Yard, and had a direct track connection to the car float transfer bridges via the Float Yard to expedite the movement of iced goods. The advent of self running "reefers" (refrigerated cars) eventually did away with the process.

B. The Maritime Operations

There are many other rail yards in the United States and more than a dozen of these were within the New York metropolitan area. However, it was the combination of switchyard with great volume of lighterage and car transfer facilities which made rail traffic around the edges of New York Harbor unusual, and it was the particularly large scale and completeness of the scheme which made the Greenville Yard unique among the yards of greater New York. This was a complete railroad freight switch yard and maintenance facility, comparable to other large yards in the nation, but it was transfer of rail freight from land to water which was the reason for the existence of the Greenville Yard. It is significant that three car float transfer bridges were among the first elements constructed here in 1904-'05, and that the two of these three bridges, which are still operating in 1983, are the last use of the facility. The majority of the employees worked on some aspect of marine operations (carfloat transfer or lighterage) at the east end of the yard, and all the lines and sidings in the switch yard portion of the Greenville Yard, with its capacity of more than 7,000 cars, led to or from the maritime facilities, and supported carfloat transfer or lighterage efforts, directly or indirectly.

Briefly, the elements which made up the maritime facilities consisted of the Transfer Bridges, the Open Pier, the Covered Pier, the Coaling Station (Coaling Pier up to 1940), the Steel Yard, and the Grain Elevator. Prior to 1969, the Marine Division of the Pennsylvania Railroad was headquartered at Pier H, north

of Exchange Place in Jersey City, and references to marine activities before that date are typical of work at the Greenville Yard, but are not always specifically describing that place. In February 1968, the Pennsylvania Railroad merged with the New York Central to form the Pennsylvania - New York Central Transportation Company (the name was changed to the Penn-Central in May 1968). As a result of this, the Marine fleets were combined so that 7 or 8 operational N.Y. Central R.R. tugs were added to the 21 tugs of the Pennsylvania Railroad. A year or two later the New Haven Railroad fleet was incorporated, adding another 5 tugs, so that briefly the Penn-Central had 34 tugs, and a much larger number of lighterage vessels. At that time of consolidation and cost-cutting, the Marine Division was moved from Pier H to the Covered Pier at Greenville Yard, and for the next 6 or 7 years operated from there. The size of the marine fleets was rapidly reduced during this time, which is well documented and is remembered by various people who formerly worked there.

1. Car Float Transfer Bridges

These constituted one of the two reasons for the existence of the Greenville Yard, so they are mentioned here briefly, even though they are not within the Study Area of the Port Authority Project. As designed and built in 1904-'05, the first three bridges were technological innovations described as having "treble articulation" at the three hinge points (Railway Age 1905:400). They became models for similiar railroad transfer bridges in the New York harbor area, most of which have now been removed (Rutsch et al. 1977: 282, 284, Kardas & Larrabee 1978: 114, 160).

Individual rail cars (box cars, including refrigerated produce cars, gondolas, flatcars, tank cars, etc.) or groups of cars were pushed by a switch engine along appropriate tracks in the Float Yard, onto one of the Transfer Bridges. The elevation of the bridge apron was controlled from above by a Motorman, adjusted for the rise and fall of the tides. This allowed the car or cars to roll onto a float where it was stopped in position by a Bridge Tender and the Float Crew. Floats were scow-hulled vessels with railroad tracks capable of holding up to 18 cars. When loaded, one or more floats were taken into tow by a tug boat, and moved to a similar transfer bridge elsewhere in the harbor, where the process was reversed.

The car float operation constituted an important link in the through freight in the metropolitan area. In some cases, freight was loaded directly from freight cars on floats to cargo vessels, but this was not the usual procedure. Most cars placed on floats through transfer bridges were destined for return to other rail lines and continuation of journey to a destination on land. Some of these were unloaded in Manhattan and Brooklyn, but a large proportion went to eastern Long Island or over the Hell Gate Narrows Bridge to New England.

2. Lighterage

The other major purpose for the existence of the Greenville Yard was lighterage, or the transfer of freight out of rail cars and into vessels. In this operation freight not only moved from land to water, but it was removed from the freight cars and put into barges or lighters for transfer to ocean going vessels or

other parts of the waterfront, or it was sometimes loaded directly into the hulls of vessels destined for coast-wise or overseas commerce. Lighterage at the Greenville Yard was handled by the Jersey Contracting Company, a separate contractor who worked with the Pennsylvania Railroad. The contracting company was compensated on the basis of tonnage moved, so the crews were encouraged to accomplish transfers as rapidly as possible.

a. Open Pier: This was designed for loading of unpackaged cargoes which were not perishable or in need of special protection and handling. Open freight cars (flat cars or gondolas) were placed on the eight tracks here, and unloaded by the four gantry cranes. Cranes No. 1 and 2, moving east and west along the north side, could work off 100 cars parked on tracks 1 and 2. On the south side, Cranes No. 3 and 4 worked 100 cars on tracks 7 and 8. Normally the four central tracks (3 through 6) held up to 200 additional cars in storage, but Crane No. 4 was capable of reaching cars on track 6, and in an emergency, track 5. Up to 250 cars could be emptied in one day.

Normally four gangs worked on the dock. Each consisted of a crane operator, two "riggers" in the railcar who attached cables or hooks, etc., and guided the lifting of cargo, two "riggers" in the boat who assisted in placing the cargo, a "boss rigger" and a "checker" who kept track of the cargo and ultimately provided the data for the clerks in the office who prepared the shipping records, billings, and other parts of the elaborate paper-work which accompanied the movement of goods by rail.

The "snap-boom" on the Open Pier Cranes required skill in handling. The cable went over pulleys in the crows nest at the top, came up the front, and ran over shivs to the main drum inside the engine house. It was possible to let gravity take the boom out to full extension but if the boom was let out too fast, gravity could pull it down so hard that cables broke or the boom "snapped off". It was also necessary to control the "intake", or lifting carefully. Normally, "two notches" at the controls were used to start up, and then "give it four notches, and it takes off" (i.e. lifts it). When lowering or "letting it out", the operator should "give it 3 notches to get it started, then drop it down to 1 or 2". These "snap boom" cranes set a pattern for cranes now used around the harbor, at big cargo and container ports. The 1905 to 1920 cranes on the open pier are, as Mr. Finley puts it, "the grand daddys" of the cranes visible, just south of the Greenville Yards, at the Port Jersey Pier.

b. Covered Pier: This was used for unloading perishable or delicate cargo. The two tracks in the depressed center section held 20 cars each, at a height so that the box car doors were flush with the pier floor. The pitch of this floor was carefully designed to make it easy to unload freight, stack it, and move it out the side doors to waiting vessels. Normally, freight from the north track went to the north side, and vice versa, but it was possible, when necessary, to move freight through the open doors of a car on the adjacent track, so that north track freight could be placed on the south side of the pier (see Appendix 3).

Before World War II, unloading of perishable freight and individual items was accomplished by use of flat trucks, hand trucks, carts, and even by hand carrying. Work at that time was done by 6 man gangs, with a checker. Wooden pallets were introduced in the 1940's and greatly reduced the number of laborers involved as did the concurrent introduction of "high-low" lift trucks, of which the commonly known "fork lift" is one variety. Gangs were reduced to four men with two in the box car and two in the lift truck. Each of these gangs placing goods on pallets and stacking those units could accomplish many times the amount of work of the earlier gangs moving goods manually. During the period remembered by persons interviewed (the late 1940's to the late 1970's) there were as many as 200 contract employees, so it is likely that even larger crews were needed in the first several decades of use before mechanization of cargo handling.

The working space was ample (roughly 200,000 square feet), so large quantities of goods could be unloaded and stored. Up to 18 tons of freight could be stacked in one 4 foot by 4 foot area (the size of a pallet) without overloading the floor, according to the foremen interviewed in 1979. By this calculation the overall weight capacity of the Covered Pier was in excess of 150,000 tons. Because of the need for moving loads and working space, it was never loaded to capacity.

c. Coaling Station: The original Coaling Pier, built by 1905, was a raised trestle, for which no detailed plans have been found. A general plan is shown in Figure 8, as of 1913-'16. In the period 1939-'41 it was replaced by a Coaling Station consisting of a new steel Coal Hopper of 680 ton capacity which rested

on a concrete "Coal Dock" (Figure 13)* Coal was fed into the hopper by means of a motor driven bucket-chain, and then released into the bunkers of coal-fired steam tugs by gravity.

Coal was supplied to MacAllister and Reichert tugs, as well as those of the Pennsylvania Railroad Marine Division. The last date a steam tug was built for the Pennsylvania Railroad was before World War II. In 1961, the Pennsylvania Railroad still had operational 4 steam tugs out of a fleet of 22 tugs, which compared to 18 steam tugs out of a grand total of 78 among all the railroad fleets in the harbor at that time (Tri-State Transportation Committee 1962: Ex.A3). Persons interviewed indicated that the last coal burners were retired from the Pennsylvania fleet shortly after this, following the delivery of two new diesel tugs in early 1961. The Coal Hopper ceased operation at this time.

For many years some of the Pennsylvania Railroad tugs bought "Constantine" brand bituminous coal from the Berwin-White Company of Jersey City, in or near the Morris Canal Basin, for the operation of their coal-fired tugs. "It was lousy coal, which just would not burn," and finally all the tugs still using coal obtained it from the Greenville Yard Coal Hopper, which was operated by the contract crew. The deck hands of the tug pulled a chain on the Hopper, and let coal fall through a chute into the bunkers (normally there was one on the port side and one on the starboard of each tug). If the operator was not careful to stop it in time, coal spilled all over the deck, and the overloaded bunker on one side made the tug list dangerously.

*Photograph NJ-49-19

A coal-burning steam tug, operating 24 hours per day, needed to refill its bunkers every second or third day. More frequent activity was maintenance and cleaning of the engine. When the day shift came on duty at 8 A.M. the fire was permitted to cool down, and 40 minutes of "ash time" was allowed, in which ash and clinker were removed. Most frequent of all was the need for steam. With each change of shift, at 8 hour intervals, the boilers were refilled with water. In "the old days" the crews simply dumped the ash and clinker into the harbor, but "after they got concerned about cleaning up the water," the tug crews had to haul the ash and clinker to an empty gondola car parked for this purpose.

The diesel tugs had several marked advantages over coal-fired steam tugs, beside not requiring re-watering every 8 hours, or cooling and emptying the fire box every 24 hours. They needed refueling every 10 days, which was only about one fourth as often as the coal tugs. Also, the captain in the bridge had complete control over engine speed, whereas in a coal-fired tug he had to rely on the engineer, who operated the engine. The favorite tugs were diesel-electric, because there was absolute control over speed, and direction of propeller rotation could be controlled instantaneously, but there were only a few of these in the fleet.

Normally a steam tug had a crew of seven men (captain, mate or number 1 deck hand, deck hand, float man, engineer, and two firemen), while a diesel tug had six (the same titles, except only one fireman or "oiler"). Scows and barges had crews of one or two men, but as these were separate vessels, the man in charge of each was called a captain. The Marine Division also employed

the bridge men and motor men at the transfer bridges, and various specialists to perform major repairs.

The Marine Division normally worked around the clock, which was described as a "three trick operation." The three shifts or tricks were slightly staggered, so that not all crews started or left work at exactly the same time. For example, the "first trick" involved some crews working from 7 A.M. to 3 P.M., some from 8 A.M. to 4 P.M., and some from 9 A.M. to 5 P.M. Tugs worked continuously, with three different crews in 24 hours, but each barge or lighter had only its crew of one or two men, so a barge normally worked only 8 hours, unless there was a valuable cargo "like cigarettes," in which case the barge captain stayed with it until it was unloaded.

d. Steel Yard: This was an area of combined switch yard and marine operations, already described. A variety of small locomotive cranes moved about, lifting and transporting steel. At the edge of the yard, steel was loaded by the large Marginal Crane (40 to 45 ton capacity), which was moved here in 1941 or 1942.

e. Grain Elevator: This stood at the inner end of the inlet on the south side of the yard. Grain was raised into this from rail cars and then fed by gravity onto barges. The elevator was removed in the late 1960's or early 1970's.

CHAPTER V

PRESENT CONDITION OF THE GREENVILLE YARD

This chapter contains discussion of the condition of the facility and its various components as of November and December 1982, when last observed by Historic Sites Research staff. It should be understood that these comments on conditions are very general and do not pretend to describe mechanical, structural, engineering, safety or any other technical aspect, which can only be addressed by appropriate specialists. These comments do provide an overall impression of the present situation, which can be combined with photographic views to assist the reader in visualizing the degree of integrity of the various cultural resources. Discussion is organized to follow the same format as that used in Chapter IV, on Yard Layout and Operations. Reference is made to some of the drawings recorded on index cards of the file system of drawings at Penn Station, New York City. It is not known if all such drawings still exist, and it was possible to inspect and copy only a few of these.

At present (December 1982) the only operations continuing are use of the Carfloat Transfer Bridges Nos. 11 and 12 by New York Dock Railway, which conveys freight cars to Bay Ridge and Red Hook in Brooklyn, and leases one or more switch engines from CONRAIL for handling these cars on the remaining trackage of the Greenville Yard. No other rail yard activity exists, and the Yardmaster's Office and other buildings are boarded up or abandoned. Weeks Dredging and Contracting

Company, Inc., uses the space between the Open and Covered Piers for tie-up and repair of vessels, and has stored dredge and drift removal material in numerous scows or lighters moored south of the Covered Pier, and piled on the old Steel Storage Yard portion of the Greenville Yard.

A. Switch Yard

The majority of this is now a vacant land surface retaining the original gradients, but very little else. Except where lines have been left in place for service to the Car Float Loading or Transfer Bridges still in operation, the extensive rail lines have been removed. The overall effect in most of the area is that of an empty industrial plain or desert with occasional rotted wooden ties, a few railroad spikes, baseplates, fishplates and some scrub grass and weeds beginning to grow in the rough surface of the clinker, cinder and gravel. A few bumpy roads run through this space, mostly aligned east - west and running between former rail lines. The majority of the powerline and floodlight poles which once were spotted over the area are also gone, and the few structures still existing are abandoned. None of the Facilities here were included in the Determination of Eligibility.

1. Yardmasters Office: This 1954 brick structure is closed, with plywood over all the windows. No major exterior structural damage is evident. This building is marked for demolition as part of a highway project near the west end of the yard. The existing building is shown in Drawing No. 46638, dated 20 August 1954. Immediately north of this structure is a dirt pile 40 feet high which appears to be intended for a road ramp.

2. Ice House Yard: Most of the former Icing Plant has been removed, but an open wooden trestle-like structure or platform still stands with an access ramp from the west. The wood is deteriorating with exposure to the elements.

3. Covered Pier Yard: There is a steel and concrete truck loading ramp apparently dating from the mid 20th century immediately west of the covered pier. There are also two small metal sheds in the vicinity of similar recent age.

4. Float Yard: A two story brick yard office stood at the west end of the Float Yard which served to control traffic coming from the Eastward Yards and then spreading onto various tracks in the Float Yard, as it approached the Transfer Bridges. The shell of this structure still exists, but all windows and interior woodwork are gone. Other structures once in the vicinity such as a water tower and stand pipe have disappeared.

B. Maritime Operations

1. Carfloat Transfer Bridges : These six bridges are not included in the study area of this project because they are in the northern quarter of the Greenville Yard, and they have not been purchased by the Port Authority. However, they are within the area determined to be eligible for the National Register, and were a major component in determining significance. The Transfer Bridges were a focal point in railroad marine operations which was among the reason for construction and operation of the yard. Consequently, they are mentioned here, if only because no discussion of the yard, past or present, would be complete without reference to their existence. However, because they are

technically outside of this study they are not described in any detail. The transfer bridges are complex structures of importance in technological history and have received various modifications since the first three became operational in 1904-'05. Many drawings in the collection at Penn Station are related to these structures.

Of the six Transfer Bridges only the central two (Nos. 11 and 12) are still in operation. The other four Transfer Bridges have not been maintained, so they are deteriorating. The southernmost structure (Bridge No. 14) has partially collapsed, with its superstructure leaning southeast toward the Open Pier. Pulley wheels and other mechanical parts may be observed lying in disarray inside and around these structures.

2. Lighterage

a. Open Pier: This 2,000 foot long structure is suffering from neglect. Rails of the eight track lines were still in place during the summer of 1979. By the autumn of 1982 all rails had been removed except those directly under the four cranes, and the decking of the pier was partly gone, apparently having been removed with the rails or having been held together by them. In various portions it is difficult or dangerous to walk on the pier.

1. Crane No. 1: This is the western of the two cranes on the north side of the pier, which straddled tracks 2 through 4 and overhung track 1. It is one of the three identical snap-boom gantry crane "Hunt Towers" of 10-ton lifting capacity, for which 1904 designs exist. These cranes were technologically innovative

and are one of the elements contributing to the determination of eligibility. It is parked next to solid land at the extreme western end or shore end of the Open Pier. Like all the other cranes, it has not operated since the copper power cable was stolen about 1970. Despite 12 years of neglect, it appears to be in reasonably good condition, and is probably the best preserved of the cranes. In 1979 it was reported that the three undamaged cranes would still be capable of operation if electric power were supplied to them.

2. Crane No. 2: This was also one of the three Hunt Towers. There was a fire on this crane in 1968, which destroyed all but the steel derrick or framework. This burnt skeleton of a crane is standing at the extreme eastern tip of the Open Pier on its north side. It no longer represents an intact structure or piece of machinery.

3. Crane No. 3: The third of the Hunt Towers is the inner or western of the pair of cranes which ran along the south side of the Open Pier, straddling tracks No. 5 - 7 and overhanging Track No. 8. It appears to be in approximately the same condition as Crane No. 1, but access is more difficult so this cannot be readily confirmed. It is parked about one third of the way out the pier, immediately adjacent to Crane No. 4.

4. Crane No. 4: This is also a snap-boom gantry crane, but of slightly different design from the three Hunt Towers. According to informants this 20 ton capacity crane was built about 1920 by an unknown manufacturer. It is parked alongside Crane No. 3, immediately east of it. Its condition is similar to that of Crane No. 3, and like No. 3, it is now surrounded by salvage company

equipment and can only be approached over deteriorating pier. Plan No. 4341 at Penn Station is titled "Spooner's Plan, Proposed Alterations to 20 Ton Unloading Tower - Open Dock - Crane # 4, dated 5/14/52". It is not known if this plan was ever implemented.

5. Power House: Built about 1905, this burned in 1972 or 1973. Before that it supplied electric power for the Transfer Bridges and the cranes on the Open Pier. At present this is only a two story brick shell with no roof. Although it was an integral part of the working complex of railroad marine operations, it is not even visually intact at present, and is no longer an essential element in the significance of the Greenville Yard.

b. Covered Pier

1. Cargo Space and Main Structure: This 1,025 foot long structure rests on a pier built on solid fill surrounded by pilings. The understructure appears sound. The building which covers it is deteriorating from recent neglect, with holes beginning in the roof and walls and several loading bay doors stuck in partly or fully open positions. Despite this surficial damage, there is no obvious sign of structural collapse, and the building still provides reasonable protection from the weather. Lighterage activities were still being conducted here in 1979.

2. Workshops: There are two one-story units built inside the west end of the Covered Pier. These contained various workshops and equipment. Although abandoned, they are in relatively good condition, having been maintained and used as recently as 1979 or 1980.

3. Office Area: At the northwest inside corner of the Covered Pier there was a two story office area containing about twenty rooms of various sizes. This was built in 1942, according to Plan No. 2349 at Penn Station. It has suffered some rain damage, due to holes in the Covered Pier roof above, and even greater damage due to human action. The records which were abandoned here have been vandalized, with file cabinets overturned and papers strewn more than one foot deep in places on the floor. Various animals and birds have lived here since this destruction and many windows are broken. The base of the entrance stair is buried in drifts of abrasive sand used in an air blasting process for cleaning pieces of equipment owned by the Weeks Company which is currently using some of the space, and some of the stair treads are unsafe.

c. Coaling Station: This circa 1940 structure consisting of a steel hopper resting on a concrete dock is intact as a framework, but has lost some of the mechanism by which coal was raised to the hopper and then let out into the bunkers of tug boats. It is still possible to visualize the relatively simple process with the aid of "as built drawings" (fig. 13)* The hopper structure is steel on a concrete base and deterioration appears to be minimal for a steel structure which has not been functional for two decades.

d. Steel Yard: This is the southeast corner of the Greenville Yard which was used for sorting and storing large structural steel items, and in some cases for assembly. Rail lines were rearranged as needed, so specific location of lines and sidings is not significant. Like the rest of the yard, it has

*Photograph NJ-49-19

been largely stripped of rails and ties, and is now a repository for piles of drift material collected from the harbor and destined for salvage or disposal.

1. Marginal or Whirly Crane: This is so-called because it is permanently fixed on the southern margin of the yard, and can rotate a complete 360 degrees. Built sometime before World War II, this 40 to 45 ton capacity crane was originally used for sand and gravel loading in the Transit Mix Plant at the foot of 23rd Street on the Manhattan East River waterfront. It was moved to the Greenville Yard in 1941, according to informants, and used for heavy equipment, such as Sherman Tanks (weight 33 tons as designed in 1940, increased to 36 tons by 1944, Chamberlain and Ellis 1969). A drawing dated 1942 exists for the relocation of this in the Penn Station map files. It was used for unloading captured equipment at the end of the war, and for steel loading operations in the post-war period. The marginal crane was still maintained and in operation in the summer of 1979. Its condition appears to be good, which is to be expected from the last major piece of equipment in the Greenville Yard to be used.

CHAPTER VI

CULTURE HISTORY OF THE GREENVILLE YARD

A. The Yard as Remembered by People Who Worked There

The period remembered by personnel who worked at the Greenville Yard is from about 1940, at the earliest, until operations ceased on 15 April 1976 for the Marine Division, and later for yard operations. Jersey Contracting, the company which handled lighterage under contract on the Open and Covered Piers was still performing some work in the summer of 1979, when the first interviews were made by Historic Sites Research.

In its heyday the Greenville Yard was a busy place, with hundreds of workers and with operations continuing around the clock. For example, during the time of consolidating several railroad marine operations (1968-1970), there were more than one thousand people on the maritime payroll alone. At any given time some of these were out on tugs and scows, but others were at the Greenville Yard performing maintenance, re-fueling, taking on loads, etc. During the 1960's there were between 50 and 60 clerks in the office of the Marine Division keeping track of lighterage cargo. After 1968 these clerical employees all worked in the two story office space in the northeast corner of the Covered Pier. The Lighterage Agent and over 40 clerks would work the first or daytime shift (normally 8 AM to 4 PM, but some worked staggered hours), a foreman and few clerks worked the second shift (4 PM to midnight), and 1 clerk worked the third shift (midnight to 8 AM).

Even on the evening or night shifts the contractor (i.e. Jersey Contracting Co.) had a "skeleton crew" of a dozen or so

men working on the Open or Covered Pier, and at peak operations there were about 200 employees of the contracting firm working in the day shift. There would be about 200 contract workers, about 40 clerks, etc., of the Marine Division, a number of tug and scow captains and crew members and the operators of the Carfloat Transfer Bridges, totaling over 300 persons working at the east end of the Greenville Yard. This does not include any of the men working in the Switch Yard itself (probably more than 100 on a normal day shift), or employees in special units such as Car Repair. There were also frequently outside crews in areas like the Steel Yard, sorting, storing, or fabricating structural units. Overall, there may have been some 500 people working at the yard during maximum period. All these employees except management personnel were union members with at least 15 different unions represented. A Union Building was present from the earliest days of the yard.

Even with the large numbers of people, the huge area of the yard was such that there was evidently no sense of crowding. A small restaurant stood between the Open Pier and the Covered Pier from at least the time of the 1913-1916 map to the 1960's or 70's, run by a concessionaire. It was considered a "greasy spoon". Employees arrived at the east end of the yard by car or by bus which "came down from the head of the yard". Some even walked the length of the yard (more than one mile) from nearby portions of Greenville or Bayonne. Few employees lived nearby, however. If they walked or bussed it was most often from the Greenville Station on the Central Railroad of New Jersey. Employees lived in a broad geographical area, and came to work

from as far away as South Amboy or "down the shore" to the south and Connecticut to the north .

There was a strong feeling that the work was well done, and a positive sense of company loyalty among the men interviewed. "When the Pennsylvania ran" the switching and transfer bridges "it was an operation," but by early 1982 "it was a disaster." The lighterage contractors "were good crews to work with" and worked very hard. The Steel Yard was so busy that "weeds never grew here." A great deal of pride was expressed in hard work, or volume of work accomplished. For example, according to Thomas Walsh of Jersey Contracting, the No. 4 Crane and one four man crew on the Open Pier handled 120 car loads of freight, weighing more than 2,000 tons, on the third and fourth of July, 1941. About 1950 it took five switch engines to service the six car-float transfer bridges. Captain Rees, last Supervisor of Marine Operations reported that four of the bridges were handling up to 1,000 cars per day for New Haven traffic, and the other two bridges served Long Island traffic. Sometimes as many as 500 "reefers" would be taken across the Hudson River on a Sunday night, to deliver fresh produce to the city markets on the Monday morning. There was direct economic inducement for productive performance for the Jersey Contracting Company, which handled lighterage. In the words of one foreman "we got paid tonnage for handling this stuff, so naturally, the least men you can use, and the more tonnage you can handle, you're making a buck." The same hard work ethic seems to have prevailed among other crews also, even though they worked directly for the railroad, which tradi-

tionally absorbed most of the shipping costs of transfer and lighterage.

There were always some problems, particularly with damages to piers and vessels caused by bumping. In the 1960's such damages averaged about \$2,000 per day throughout the Marine Division and a common saying was "tell your troubles to Jesus, don't bother me with them." Friction sometimes existed on coal burning tugs between the captain and the engineer over the engine speed, which contributed to some minor collisions, and there were occasionally incidents concerning jurisdiction between different crews in the Switch Yard. Railroad documents, such as Employees Personal Injury Records indicate that a few work injuries did occur, and there was at least one fatal accident when John J. Durham was killed on the "Open Dock" on 25 May 1955 (Index files, Pennsylvania Railroad, New Jersey Division Records, Penn Station).

Some cargoes handled were especially memorable. Members of the Jersey Contracting crew remarked about unloading captured German and Italian tanks, which were sent to the U.S. Army Ordnance Proving Grounds at Aberdeen, Maryland. The large caliber German railway gun called "Anzio Annie" was brought in, and unloaded in parts. Its total weight was over 500 tons. When its trucks were resting on the Open Pier, and the barrel and breach were mounted, there was such precision balance that one man with a crow bar under the wheels could make it roll. One of the foremen drove Hitler's bullet proof Mercedes onto the Covered Pier. One of Herman Goering's cars was brought here also, and samples of iron or steel armor plate.

Another unusual item was the wreckage of an airplane, transported to the yard by water. This was "coopered" for shipping out by rail. Coopering (the term once referred to barrel making) was the term for fine crating or boxing and necessary carpentry repairs. It was performed by skilled craftsmen in a cooperage shop on the Yard. The unloading and loading crews also did rough carpentry for blocking and bracing cargo before shipping in a box car and removing the same before unloading. Good quality 2" x 4" and 6" x 6" lumber was used and this was normally recycled many times.

Storms which affected the facility also were remembered by former employees. One such event was when six large grain cargo carriers had been loaded with 50,000 tons of grain and tied up next to the Greenville Yard. A hurricane blew the hatch covers off and waves came in and swamped three of them, which sank in 30 feet of water at their moorings. The Marine Division finally got a feed company to pump the wet grain out. Of course this made it salty, if not worse as feed, "but the animals aren't able to complain". Another sort of storm damage occurred in the late 1950's when a hurricane blew some of the planks off the cover of the Coal Hopper. They went right through the siding of the covered pier.

Tensions were created during the period of reductions in force as the various railroad maritime operations were slowed down and finally ended. However, most of the actual problems did not occur at the Greenville Yard, which was the location where operations were maintained during mergers and reductions, but rather involved resistance to closing down the other railroad

maritime facilities. For example, in August 1963, Teamsters Local No. 518 threatened to strike operations at Bay Ridge and elsewhere in Brooklyn, to protest anticipated layoffs resulting from the Pennsylvania Railroad taking over freight operations of the Long Island Railroad (Long Island Newsday 1 August and 10 August 1963, Long Island Press 7 August 1963). In May 1970 the Brotherhood of Railway, Airline and Steamship Clerks, Freight Handlers, Express and Station Employees had a dispute concerning transfer of former New Haven Railroad lighterage activities for the Harlem River to Greenville (New Haven Railroad file, Greenville Yard).

Both of these were disputes involving terminations elsewhere, and consolidation of effort from scattered locations to the Greenville Yard. Consequently, the Greenville Yard was perceived as a place of relatively stable or continued employment during the difficult period in the 1960's and 1970's. When the end of maritime operations came at Greenville, it was abrupt. Marine Division employees were told "This is your last day - just lock the door and don't come in tomorrow". When the Superintendent of the Division asked about all the records and papers he was told "not to worry about them." This was April 15, 1976. Some of the employees were given two or three days to clear out their personal possessions, and many of those with seniority or special skills and knowledge were transferred to other positions in the amalgamated railroads. This instantaneous nature of the cut off of Greenville Yard maritime operations meant that there was not a lingering period of terminal decline. The facility operated at

only slightly reduced capacity into 1976, and then became an almost completely deserted industrial ghost town overnight.

Before the end came, however, there was a stable work force here. Tabulations made during the period of consolidations show many employees with over 40 years of service. One former tug Captain and Director of Maritime Operations was proud of having worked "37 years with the railroad Maritime Division and never a sick day". Part of the stability was due to family ties. Tug and barge crews were often made up of closely related men. One such crew was described by a man who had hired on in 1946 as Employee No. 525 in the Maritime Division (i.e., at that time there were more than 500 men with seniority ahead of him). His father-in-law was captain, his father was mate, one brother was an oiler in the engine room, and he was a deck hand, so 4 out of the 6 men on that diesel tug were related by blood or marriage. There was also a tendency for certain ethnic groups to concentrate in various roles. Scows and barges were often operated by a captain and one deck hand. Many of these small crews consisted of fathers and sons of Norwegian or Swedish descent.

Some Jersey City residents considered the Greenville Yard (if they considered it at all) "a place where men were busy...the average person couldn't go there...and a place where men were injured". However, to the people who were employed there, it is favorably remembered as a place where people cooperated and worked hard to perform the important task of keeping the freight moving between rail and water.

B. The Community of Greenville

The community known as Greenville Township was formed in 1863 from the Township of Bergen. It lay between Myrtle Avenue and the Morris Canal and Newark Bay and Upper New York Bay. It had been settled by descendants of the original Dutch inhabitants of the villages of Communipaw and Bergen north of it. In 1873 it was annexed to Jersey City (Snyder 1969: 146). Throughout the latter 19th and early 20th centuries the community continued to exist as a neighborhood with a strong sense of civic identity.

Historic views of Greenville in the late 19th century show it as an open community with housing scattered along streets in a park-like setting. A forested knoll known as Currie's Woods stood in the center of the community. Another wooded section on the eastern slope of the ridge, centered on Chapel Avenue, became the New York Bay Cemetery which opened in 1848. Hudson (now Kennedy) Boulevard was also opened in that year. The Morris Canal was opened to the Tidewater Basin in Jersey City in 1838, and the Central Railroad of New Jersey line was completed to the ferry terminal in what is now Liberty Park in Jersey City in 1864. These two parallel transportation line separated Greenville from New York Bay, but Chapel, Linden and Atlantic Avenues crossed over these sunken travel routes on bridges to provide access to small docks and landing spots on the shallow bay (1880 Sanitary & Topographic Map).

The section along Garfield Avenue (formerly the Old Jersey City and Bergen Point Plank Road) was settled by wealthy businessmen and professional men shortly before and after the Civil War. Some prosperous residents built

houses along the heights above the location of the Greenville Station of the New Jersey Central Railroad. Another favored area was the shore of the bay on a slight elevation between the bay and the marsh, near the site of the New York Bay Hotel, a noted hostelry patronized during the summer seasons by those in search of health and recreation. Oysters and fish were plentiful.

From before its incorporation in 1863 until Greenville became the location of manufacturing interests and urban housing (see below) this was a rural community of fields interspersed with groves of trees. During the latter 19th century, up until about 1910, much of the community was devoted to intensive farming or "truck gardening". It prospered during the Civil War because the usual supply of early vegetables from the south had been cut off. Crops were grown in "hot beds" and readily sold in the New York market. In 1913, the Seventh Ward was still referred to as "Celeryville" (*The Jersey Journal* 19 April 1913).

The area near Caven Point, where the land curved out into the bay a short distance north of the future location of the Greenville Yard, became sought after by manufacturing interests. These included a wine and liquor distillery which was short lived. This was followed in about 1863 by a window glass factory which lasted until after the Civil War when it could no longer compete with the price of French glass which flooded the market. Other types of enterprises included a fertilizer establishment and an iron works (Van Winkle 1924:127-129).

Major residential growth occurred following the opening of the Central Railroad of New Jersey in 1864, and in the early 20th Century, between 1910 and 1920 (shortly after the completion of

filling of the site for the Greenville Yard). The Jersey Journal, January 21, 1911, reports that Greenville had its biggest growth during 1910. According to John Saul, Jersey City Building Superintendent, 244 new building permits were granted in Greenville.

In an article entitled "The Phenomenal Growth of Greenville" in The Jersey Journal, April 19, 1913, one learns of the current interests. In 1913 the Seventh Ward (Greenville) had the fastest growth of residential development of farmland of any of the wards. A new school at Warner Avenue and the Boulevard, which had opened in 1912, was already inadequate to serve the rapidly growing population. Across the street from the school was the first hospital, also built in 1912, which would soon open its doors to patients. A Catholic school was planned for Bayview and Jackson Avenues. The greatest development of the Seventh Ward in the previous two years had been in the Woodlawn and Bayview Sections where "dwellings have gone up like mushrooms". Improvements in the local transportation system connecting Jackson Avenue with Journal Square "and the Summit Avenue station of the Hudson and Manhattan tube" from downtown New York, and with Bayonne, had been in part responsible for the steady influx of homeseekers. The 1913 article noted the breaking up of the Simpson and Beeker Farms, and ended with the speculation that much interest in local real estate has been generated by "talk of having a Navy Yard established on the Greenville shore". The sense of local pride is reflected in improvements such as the planting of 200 shade trees in 1915, and growth and prosperity

which were marked with civic and industrial parades (Jersey Journal 12 April 1915:3, 28 May 1915:5).

At the same time that Greenville was a growing residential community, the Pennsylvania Railroad's Greenville Yard was under construction and becoming operational. Growth of the residential area and the freight yard side-by-side created certain conflicts, common to the post Civil War industrial era (Bettman 1974). This was summarized in a 1916 newspaper article titled "Why Greenville had a Rod in Pickle for the Railroads -Not Only Kept Awake at Night by Shrieking Locomotives, but Almost Smothered by Soft Coal Smoke in Addition" (Jersey Journal 12 Oct. 1916: 4). This article recorded complaints about noise of steam whistles and air pollution from coal-burning locomotives, coming from the tracks of the Lehigh Valley Railroad, Central Railroad of New Jersey and the Pennsylvania Railroad Greenville Yard. "The various noises from the Pennsylvania yards and especially the long continuous whistling makes sleep for people in the New York Bay section of Greenville only fitful". A tennis tournament in Bay-side Park was interrupted when smoke reduced the player's visibility, and residents complained that all vegetation was suffering, especially fruit trees, and that homes and laundry could not be kept clean. In 1911 Jersey City fined the Pennsylvania and Erie Railroads for using soft coal and the Pennsylvania sought to set aside its conviction for 99 violations of the city smoke ordinance (New York Times 16 July & 23 August 1911, 1:5 & 2:5).

While the development of railroad facilities along the Upper New York Bay Jersey Shoreline was once hailed as beneficial, progressive and bringing in monies to Jersey City, by 1920 the mood had shifted. A report published by the Board of Commissioners of Jersey City in 1920 expressed the attitude that the railroads "stunted and retarded the general development of the City of Jersey City. . . the grip of steel at the throat of the city has stifled its development for half a century" (1920:63). The rationale for this conclusion was that there was unnecessary duplication of railroad facilities, and that this created a lack of pier space (because of the extensive landholdings for each railroad). The solution was thought to be that the railroads should coordinate their freight classification and car sorting somewhere west of Jersey City, adjacent to Newark Bay and the Passaic and Hackensack Rivers. Transatlantic freight would leave and arrive directly at ship terminals built on the Hudson, and lighterage would only move express freight packages, transported by the passenger steamships, and commodities and food-stuffs for use in New York City.

Contemporary records indicate that the Greenville Yard was not perceived by the residents of Greenville to be a part of the local community, for the reasons that it did not employ many local residents, as noted in the first part of this chapter, or bring in secondary businesses, and because the railroad practices of the time created unwelcome conditions for those living nearby.

Ironically, the freight yards and passenger lines of the late 19th and early 20th centuries are remembered publically for their negative aspects rather than positive ones. The truly unique role these yards and the development of other port facilities around the New York Harbor have played in American transportation and shipping history have been understated in local histories and community consciousness. Local reaction focused on the negative impacts of railroad operations at that time. The soft-coal burning, smoking, noise-producing rail systems of the era between the Civil War and the end of the Second World War have left their scars on the lives of many urban and suburban communities of the northeast, and the situation described here was not unique to this facility (Bettman 1974).

During the last 60 years, with changing technology, laws, urban planning and civic concern, many of these conflicts have been eliminated. Railroad practices employed new technology such as diesel-electric locomotives and radio communications for yard operations. The developers of modern railroad and related marine facilities have available to them the lessons of the past, through understanding of which it may be possible to avoid such conflicts in the future.

CHAPTER VII

THE PLACE OF THE GREENVILLE YARD IN TRANSPORTATION HISTORY

In tracing the development and functioning of the Greenville Yard from its inception in 1904-05 to the present, we have studied a rail yard built at a point in history when rail freight was the dominant method of moving commercial goods into and through the Port of New York and New Jersey from its period of maximum use, before the introduction of the motor truck about 1920, until the 1960's and 1970's.

The major period of development of the Greenville Yard was between 1905 and 1920, a period which saw a continual expansion of harbor facilities. Changes continued to be made up through the Second World War. However, nearly all of the yards and harbor facilities constructed or laid out by the railroads were in place when the First World War began in Europe (Condit 1981: 109). From a historian's perspective, this technological conservatism is evident in the sequence of yard plans. Many plans were made during the period of construction and development, but the most recent complete plans were those drawn in the early 1940's, with only a few updated pencil notations since that date.

At its heyday, this yard was the best equipped railroad-marine transport terminal in the harbor, and it is notable that some of its original equipment, such as the 1905 transfer bridges, is still used for this function. The yard operated for marine transfer through two World Wars, and later, after other means of freight transfer had begun to replace its original

function, it served as a staging and assembly area for such major building enterprises around the Port as construction of the Bruckner Expressway, the George Washington Bridge, the Verazzano Bridge, and most recently, the World Trade Center towers. Projects of this magnitude took advantage of the existence of this facility and were able to use the same equipment, despite its advancing age. The major purposes for which the yard was designed, namely carfloat transfer and lighterage have, over the years, been replaced by the motor truck and modern highway bridges and tunnels linking New York to New Jersey. Gradually the track yards have been removed and the heavy equipment abandoned. The structures themselves are disappearing, and soon all that remains will be the filled land units and decaying piers.

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APPENDIX 1

LIST OF PERSONS INTERVIEWED

- Ciurczak, Jeanette
Stenographer & Secretary, Marine Division, 1943-1976
retired CONRAIL, 1980
Cranford, New Jersey
- Finlay, James
Foreman, Jersey Contracting, Greenville Yard
(started work for company in 1940 on New York City Piers in 1940, came to Covered Pier at Greenville in 1972. Interviewed in June 1979, when Lighterage still being transferred.)
- Flynn, William
Draftsman, Real Estate Division Eastern Region
CONRAIL
15 no. 32nd Street
Philadelphia, Pa. 19104
(started in Valuation Department in 1952 on Bay Ridge Branch which work included Greenville Yard).
- Lawless, Robert
Administrative Assistant to Assistant Division Manager
AMTRAK
Penn Station
7th Ave. and 32nd Street
New York, N.Y. 10001
(worked as Car Clerk at Greenville in 1960's).
- McLaughlin, James
Manager Operations Improvement
Eastern Region Office
CONRAIL
Room 435, 30th Street Station
Philadelphia, Pa. 19104
- O'Dwyer, Thomas
Assistant Chief Engineer, Planning (Eastern Region)
CONRAIL
15 No. 32 nd Street
Philadelphia, Pa. 19104
- Rees, Frank, M. (Captain)
601 W. Lake Ave.
Rahway, N.J. 07065
(started as tug deckhand 1946, was Supervisor of Marine Operations at time of CONRAIL closing of operations in 1976.)

Schrippia, Joseph
Yardmaster
Port Reading Coal Terminal
CONRAIL
(former Trainmaster at Greenville Yard, started in the Car
Repair Shop in 1945).

Toy, Herbert
Gainesville, Florida
(Lighterage Agent at Greenville Yard from 1962 - 1969).

Unangst, H. Stephen
RFD 3, Box 81
Cambridge, Maryland 21613
(became Boatmaster in 1950 was promoted in 1962, and left
Greenville Yard, retired 1967).

Walsh, Thomas
Foreman, Jersey Contracting Greenville Yards
(started work at Greenville Yard part time in 1937, full
time 1940. Interviewed in 1979, when Covered Pier was still
in use).

APPENDIX 2

GLOSSARY OF TERMS

Abbreviations for frequently cited sources:

W 3rd: Webster's Third New International Dictionary, 1976

EB 13th: Encyclopaedia Britannica 13th Edition, 1926

Tri State: Tri State Transportation Committee 1964
(see Bibliography)

J. Finlay, or T. Walsh: operational definitions given
during interview of 18 June 1979 by then
foremen of Jersey Contracting Company.
(see List of Persons Interviewed)

Port Authority: operational definitions supplied with
letter of May 18 1983, from M. Giari, Port
Department, Port Authority of New York and New
Jersey.

BARGE

"roomy, usually flat-bottomed boat used primarily in harbors or inland waterways...for transport of goods...usually propelled by towing" (W 3rd: 176).

A scow-hulled vessel with a roof for protecting perishable freight (J. Finlay)

A covered lighter (Tri State: 13).

An open or covered lighter (Port Authority)

BOOM

"a long beam projecting from a derrick to support or guide the body to be lifted or swung" (W 3rd: 253) Same as jib.

CARFLOAT

A scow hulled vessel with railroad tracks, designed to transport railroad freight cars, which are rolled on and off at transfer bridges. If completely open, and used only for transporting cars, it is an "Interchange Float". If there is a covered freight platform down the center, and float was used by mooring to a pier and freight then unloaded, it is a "Station Float" (Tri State: 12).

CONSERVATISM

"the tendency to remain narrowly adapted to a particular environment and undergo minimal change or differentiation (W 3rd: 483).

CRANE

"a machine for raising and lowering heavy weights and transporting them through limited distances" (W 3rd: 529)
Strictly, refers to the arm, boom, or jib from which load is suspended, but commonly is used to include the entire mechanism by which a load is raised vertically and moved horizontally (EB 13th, vol. 7: 368).

CROWS NEST

"an elevated platform (as on a ...derrick)" (W 3rd:545)
A small deck or platform near the top of a crane, similar to a crows nest on a ship's mast.

DEMURRAGE

"a charge assessed for detaining a freight car, truck, or other vehicle beyond the free time stipulated for loading and unloading" (W 3rd: 601).

DERRICK

"a framework or tower..." (W 3rd: 609)

Skeleton or open towers erected at a construction site or work yard (EB 13th, Vol. 24: 281).

GANTRY CRANE

"a bridge crane, in which a beam or bridge is carried at each end by a trestle that travels by tracks on the ground" (W 3rd: 935).

"a raised frame that travels by tracks which spans the area where material is moved, usually by traveling on rails (Port Authority).

"Hi-Low"

A machine for lifting and placing cargo, especially cargo on pallets. The most common is the variety called a "Fork Lift Truck", but other attachments or grasping and holding devices may also be used (J. Finlay).

HUMP

"an elevation in a railroad switch yard up one side of which the cars are pushed by an engine and down the other side of which they are switched by gravity to their proper tracks" (W 3rd: 1102).

JIB

Effectively the same as a boom, the arm on a derrick or crane.

JIB CRANE

an ordinary crane. A typical example is a revolving crane with an arm which can be raised or lowered, with a lifting mechanism at the end (EB 13th, Vol. 7: 368).

LIGHTER

"a large, usually flat-bottomed boat or barge used in unloading ships...or in transporting freight around a harbor" (W 3rd: 1308)
A vessel for transporting cargo unloaded on shore to a ship or another part of the harbor for reloading (see Barge, Scow, and Stick Boat, Tri State: 13, Pa. RR 1949).
Sometimes used to refer specifically to open lighters or scows (J. Finlay).

LIGHTERAGE

"the loading, unloading, or transportation of goods by means of a lighter" (W 3rd: 1308)

Effectively, the transfer of cargo from shore to ship or vice versa, or to another shore, by means of intermediate loading into a Barge, Scow, or Stick Boat. The term was also used to refer to all the goods so moved, as well as to the process of moving them (Via Port of New York May 1952: 1-3).

For railroads, it meant unloading or loading cars on shore, and transferring the lading onto a lighter (Tri State: 13).

LOADING BRIDGE (or Float Bridge, or Transfer Bridge)

An overhead structure supported at each end which contains mechanisms for raising and lowering bridges and aprons to adjust for changing tide levels, so that freight cars can be pushed on or pulled from carfloats (Via Port of New York May 1952: 1).

LOCOMOTIVE

"A self-propelled vehicle...running on rails...used for moving railroad cars" (W 3rd: 1329).

As an adjective, applied to a work crane, it means that it is capable of moving itself from one part of a dock, pier, or yard to another.

PALLET

A wooden platform on which cargo or freight is loaded, and which can then be moved, stacked, stored, etc, by machine. A standard pallet is 40 inches by 48 inches (Port Authority).

"Reefer"

A term used for a cargo transporter which is refrigerated, for example, a Refrigerator Car for perishable rail freight (O'Connor 1949: 76). When applied to a lighter, as "A Reefer Boat", it meant a barge with an insulated cover, capable of being refrigerated (or heated) to protect sensitive goods (T. Walsh).

SCOW

"A large, flat-bottomed boat with a broad, square end, that is used for transporting sand, gravel, or refuse" (W 3rd: 2038)
An open lighter (Tri State: 13)

SCOW-HULLED

With a hull shaped as above. The common form for lighters.

SNAP BOOM

A hinged or jointed boom or jib on a crane, which can "snap" flat into maximum extended position.

STICK BOAT

A lighter or scow-hulled vessel with its own jib crane capable of handling cargo (Tri State: 13).

SURCHARGE

A term in land-making and filling, meaning to place more fill or weight on an area than ultimately intended, so that over a period of time (usually some months or years) the underlying fill will have become fully compressed, dewatered, and stable. The surcharge material is then removed, leaving the made land prepared for use.

"Trick"

A working shift (W 3rd: 2442).

APPENDIX 3: CROSS SECTION OF THE COVERED PIER

TECHNICAL DESCRIPTION FOR SCHEMATIC DRAWING OF COVERED PIER
CROSS SECTION

From the floor level down, the drawing is based on a greatly reduced drawing reproduced in Cresson (1916: 33), filled out and interpreted on the basis of Cresson's text.

From the floor level up, the drawing is based on a field sketch made on 16 November 1982, and on photographs made at that time.

Horizontal dimensions at floor level are actual dimensions (shown as 24', etc.)

Vertical measurements above floor level were made with a 20 foot rod, with visual scaling of dimensions higher than 20 feet (shown as ca. 32', etc.)

The roof framing system is correct for position and relationship of members, but was not measured, so dimensions shown are approximate only.

ESTIMATES OF VOLUME, BASED ON 1916 DESCRIPTION

Assumption: the depth of fill, including riprap retaining structures, up to the bottom of the platform = 30 feet

Thickness of fill on platforms = 8 feet

Cross section of the lower fill (this does NOT include any estimate for probable extension of riprap which must slope to a normal angle of repose. It assumes a rectangular mass)

30 feet high x 132 feet wide = 3,960 sq. ft.

Cross section of the upper fill (full width of pier)

8 feet high x 200 feet wide = 1,600 sq. ft.

Total = 5,560 sq. ft.

VOLUME Cross section x 1,025 ft. (length) = 5,699,000 cubic ft.

/27 (cu. ft. per cu. yd.) = 211,074 cu. yds.

APPROXIMATE SOLID FILL VOLUME 205,000 to 215,000 cubic yards

ESTIMATES OF PILINGS AND OTHER WOOD IN BASE OF PIER

Note: the length of the piles is unknown, but probably exceeds 30 feet in most cases.

NO estimate is made for any material in the structure which covers the pier.

Assumption: the 1916 drawing shows, on each side a platform extending 34 feet, supported on ten pilings, plus a bracing pile and an outside guard pile. The text describes piles as 5 feet on center, running the length of the pier.

Each side, 12 pilings, x 2 sides =	24 piles per row
	x
Length of pier, 1,025 feet, /5 feet per row =	205 rows

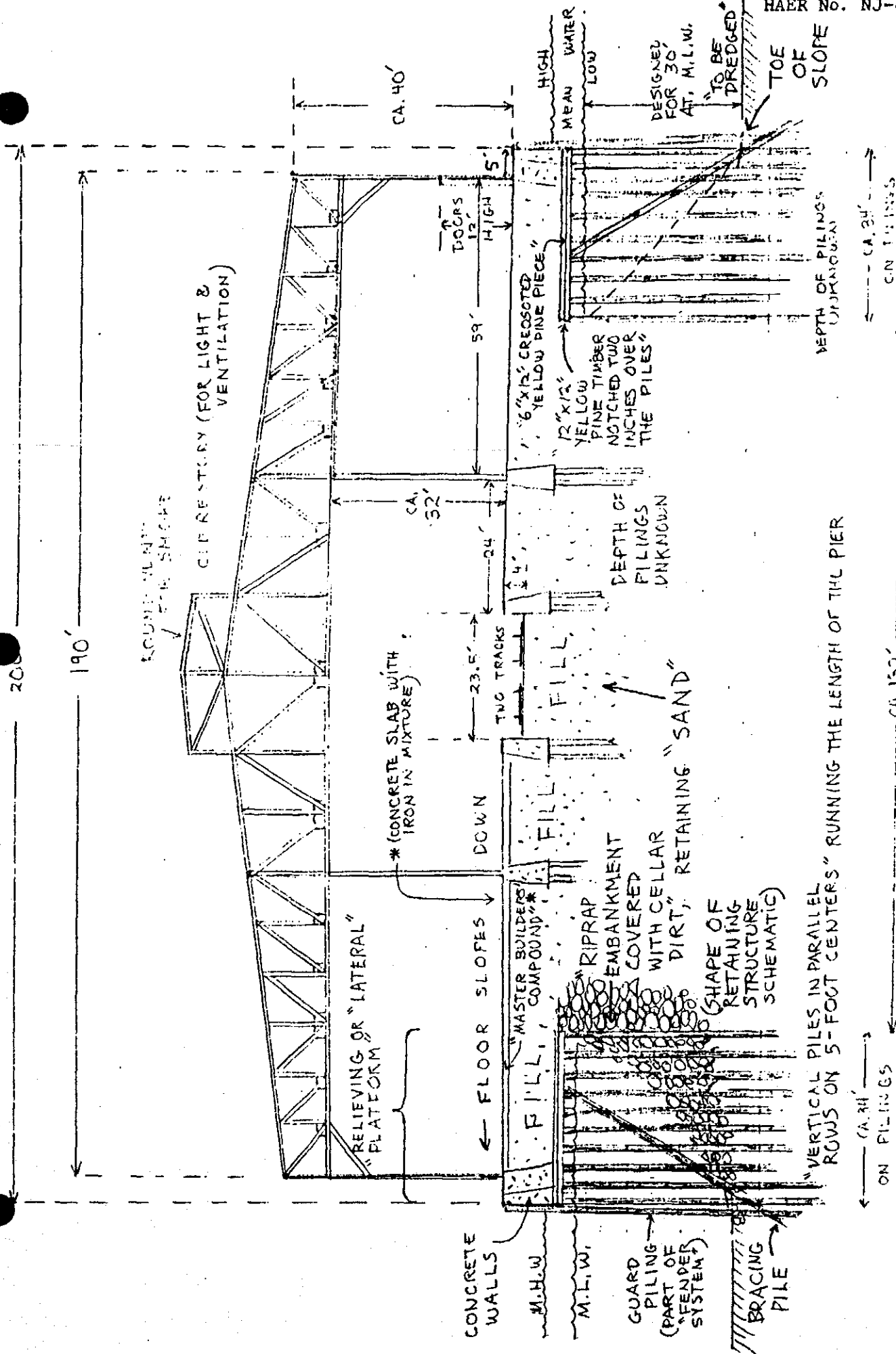
Total number of pilings = 4,920

12" x 12" timbers, 34 ft. long, 2 per side x 205 rows = 510

6" x 12" timbers, (same as above ?) 510

Total number of timbers = 1,020

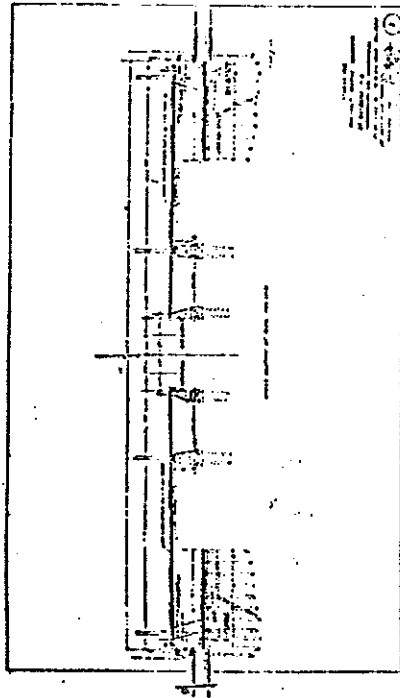
ESTIMATED NUMBER OF PILINGS AND LARGE TIMBERS ca. 6,000



SCALE
1 IN. = 25 FT.
0 5 10 15 20 25 FT.

"EACH PILE ROW... BECOMES A BUTTRESS TO THE RETAINING STRUCTURE"

Pennsylvania Railroad Pier at Greenville, N. J.



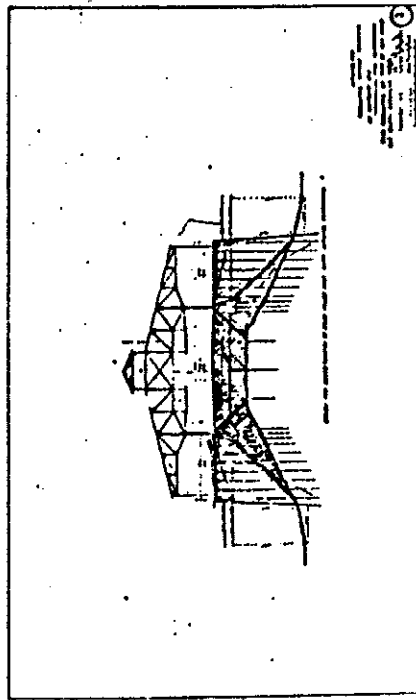
Drawing No. 2 illustrates the low grade type of construction such as that now being built by the Pennsylvania Railroad at Greenville with a length of 1,020 feet and a width of 200 feet. The interior or filled-in portion proper is retained in place by riprap embankments covered with cellar dirt. The cellar dirt is used for filling in the crevices amongst stone to prevent and retard the percolation of the sand filling through the riprap embankment. The lateral platforms in this construction are low grade and filled in on top, the filling being retained by means of concrete walls built on top of the platform along the wharfage face, forming not only a retaining structure for the filling, but also a wharfage for vessels. These platforms are 34 feet wide, supported upon vertical piles arranged in parallel rows on 5-foot centers. The piles are capped with 12" by 12" yellow pine timber notched two inches over the piles. Each pile row is also braced with a bracing pile and the platform, therefore, becomes a buttress to the retaining structure. A flooring is provided for receiving a super-imposed filling over these platforms by means of a 6" by 12" creosoted yellow pine piece. The traffic floor over the platform area is a very hard material consisting of what is called "master builders' compound" which is a concrete with considerable iron in the mixture and adapted to resist heavy trucking. This type of pier is admirably adapted for the con-

struction of foundations for the subsequent sheds and buildings that may be built over the pier area. Longitudinally along the center of the pier provision is made for a depressed double track railroad.

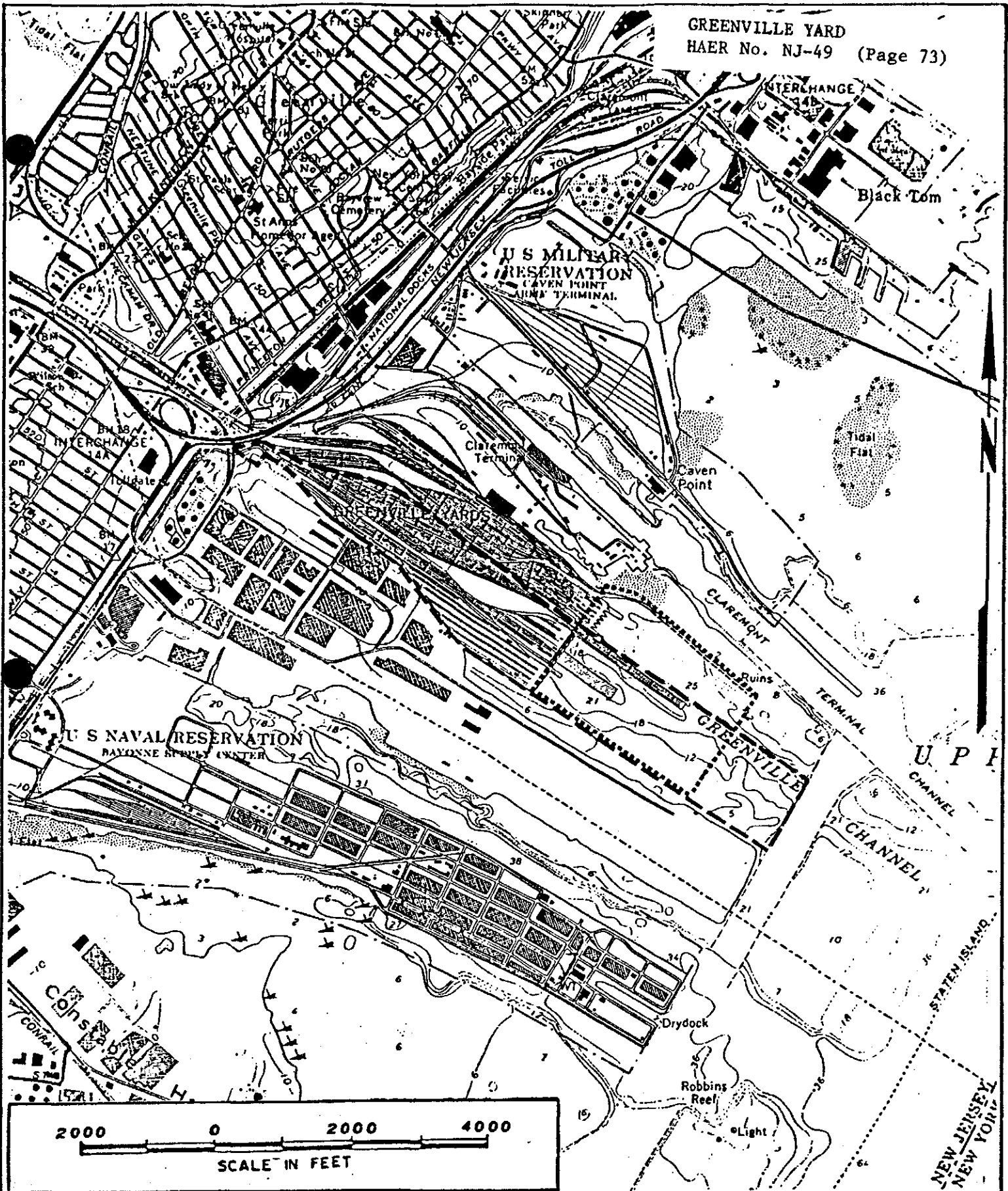
The fender system is very effectively fastened to waling pieces anchored to the outer face of the concrete wall, and lends itself very efficiently to this type of construction. Thus the wall also serves as a foundation support for the outer posts of any structure such as a single or double dock shed. The slips along the wharfage side in these platforms are designed to be 30 feet deep at mean low water.

The principal point of criticism in this particular type of pier is the fact that insufficient support is provided by the toe of the riprap embankments against future dredging and the inevitable sloughing off of the toe of the embankment. Within the limits of reasonable cost, I regard this as one of the best types of filled-in piers.

New York Dock Department Pier at South Brooklyn (proposed).



Drawing No. 3 illustrates a type of filled-in pier which was originally intended to be built in that portion of South Brooklyn known as the Gowanus Section. The essential features in this type are legitimate retaining walls or bulkhead walls supported



STUDY AREA LOCATION MAP

Plotted on USGS Quad: Jersey City (1981)

----- Port Authority Property

..... National Register Property

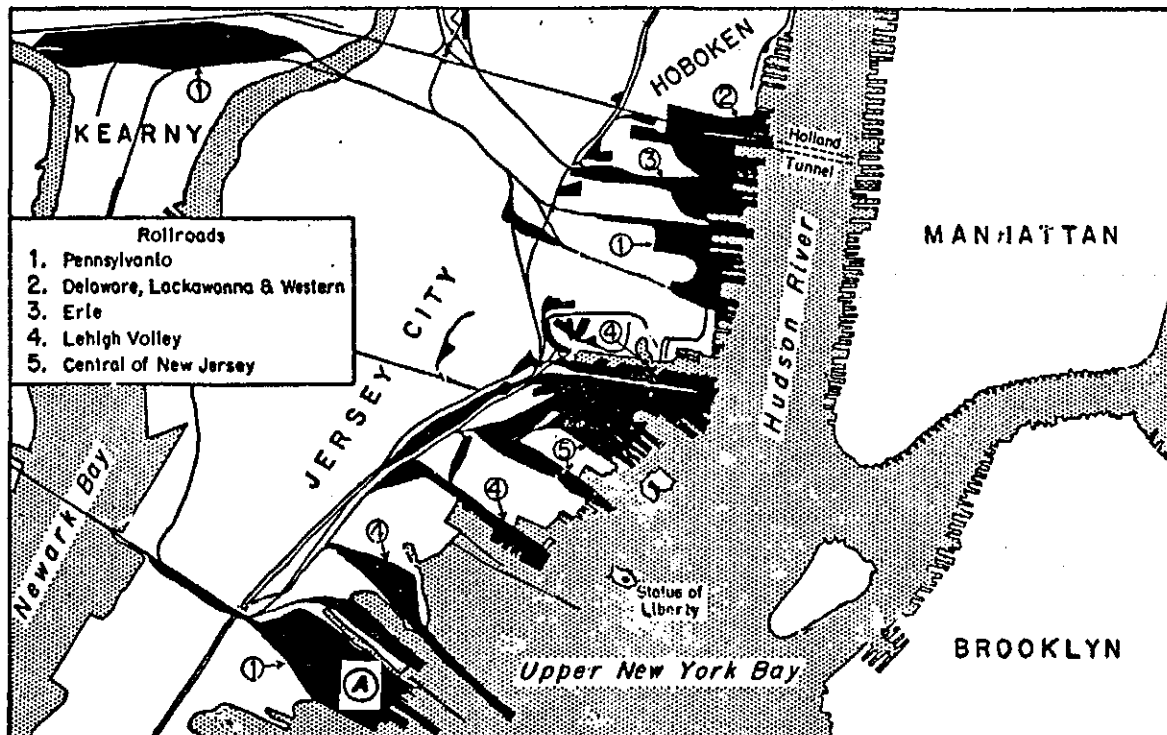
GREENVILLE YARD

RECORDING & CULTURAL HISTORY

FIGURE 1

HISTORIC SITES RESEARCH JAN. 1983

Chart 6 Railroad Freight Terminals on the New Jersey Waterfront



Areas in black are railroad yards and railroad docks. There are other New Jersey rail freight facilities not shown on map. For example, the New York Central and the Erie have terminals at Weehawken, farther north, and the Reading on the Arthur Kill, farther south.

Ⓐ - Indicates the Greenville Yard (Chinitz 1960 : 39)

FIGURE 2

**1960 MAP OF JERSEY CITY FREIGHT TERMINALS
AREA MAP FROM CHINITZ, SHOWING RAIL YARDS**

GREENVILLE YARD

RECORDING & CULTURAL HISTORY

HISTORIC SITES RESEARCH JAN. 1983

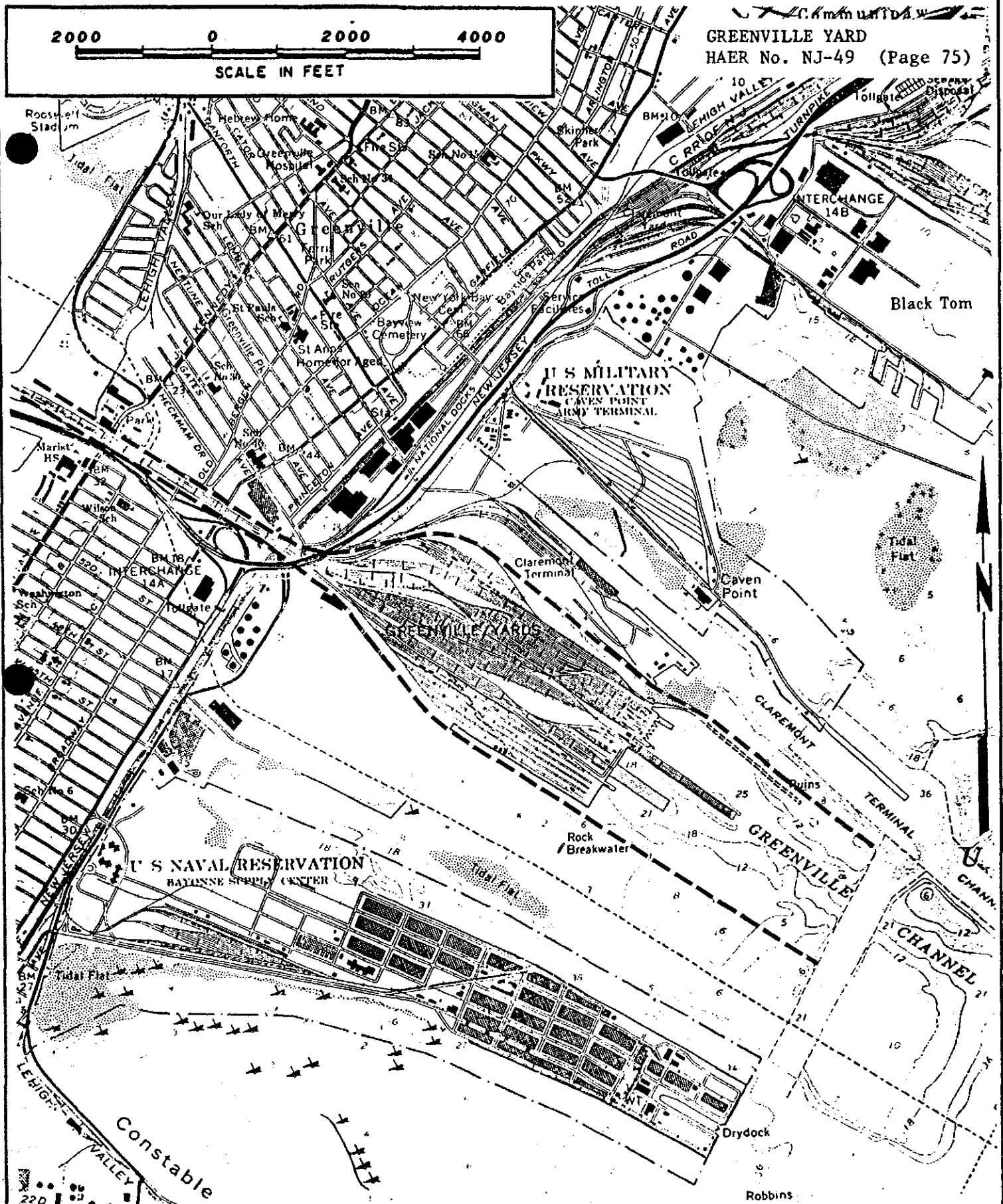


FIGURE 3 OPERATIONAL BOUNDARIES MAP
 Plotted on USGS Quad: Jersey City (1967)
 --- Former Operational Boundary of
 Pennsylvania Railroad Greenville Yard

GREENVILLE YARD
RECORDING & CULTURAL HISTORY
HISTORIC SITES RESEARCH JAN. 1983

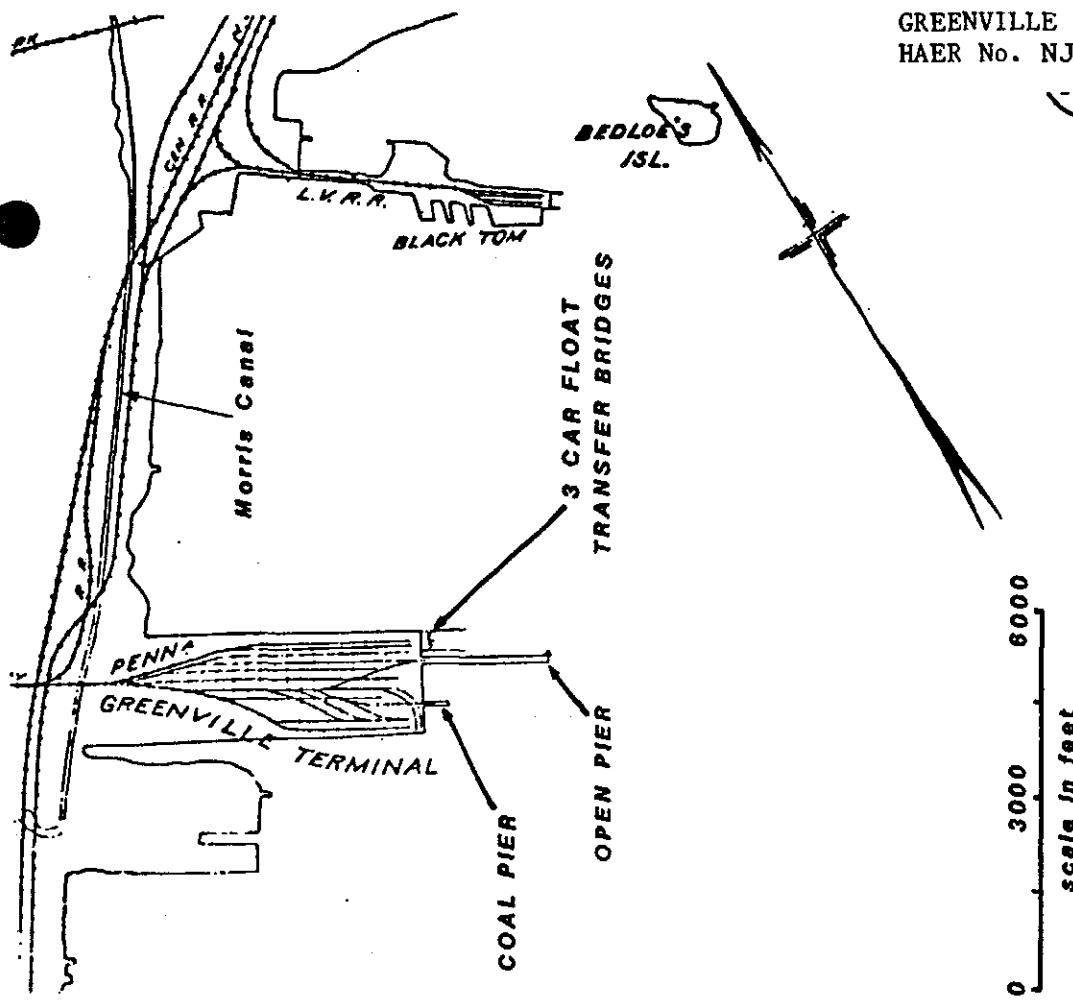


FIGURE 4

1911 - MAP OF A PORTION OF MANHATTAN AND ADJACENT
NEW JERSEY SHORE WITH RAILROAD LINES AND TERMINALS
from Annual Report of N.Y. Dept. of Docks and Forts

GREENVILLE YARD
RECORDING & CULTURAL HISTORY

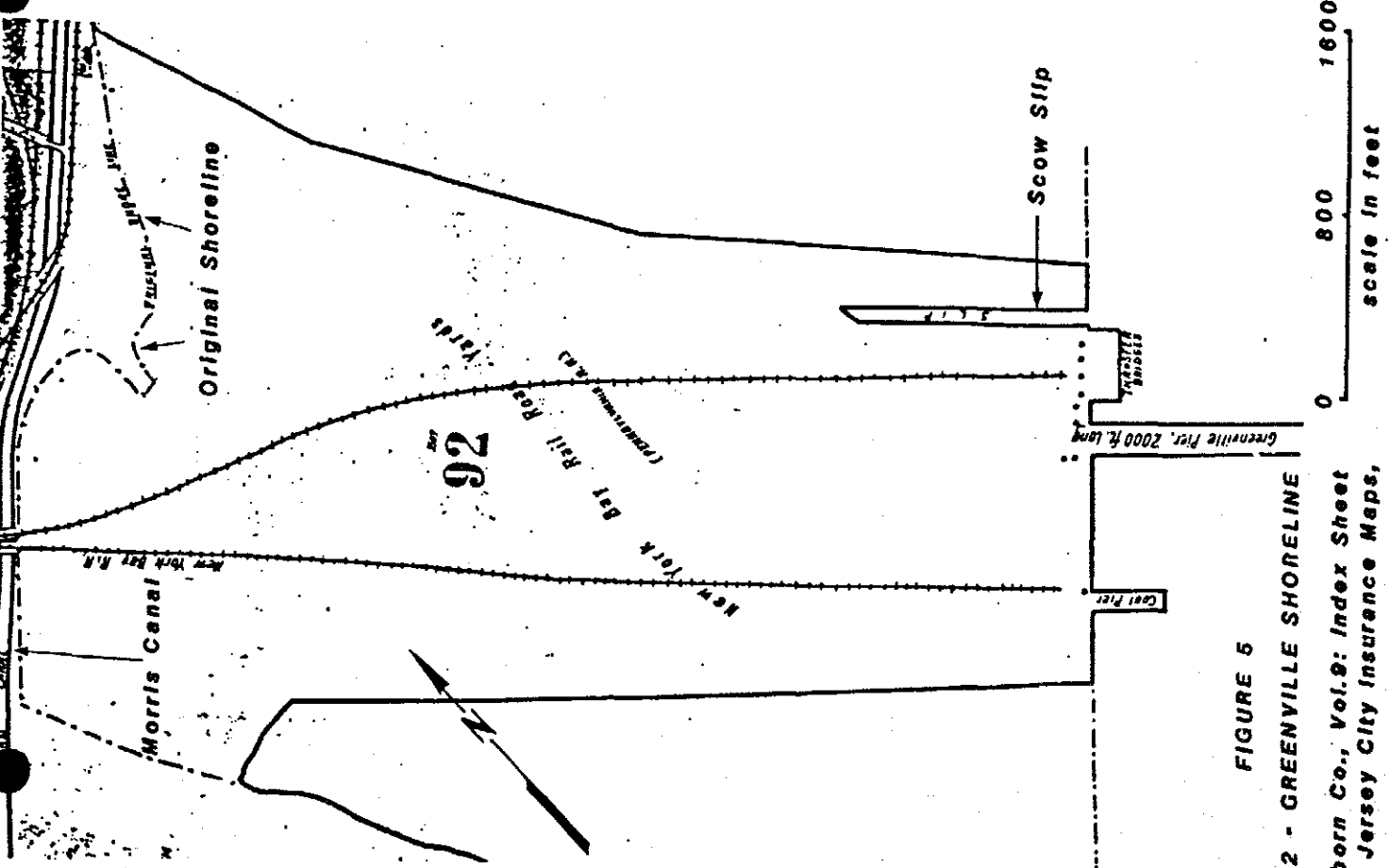
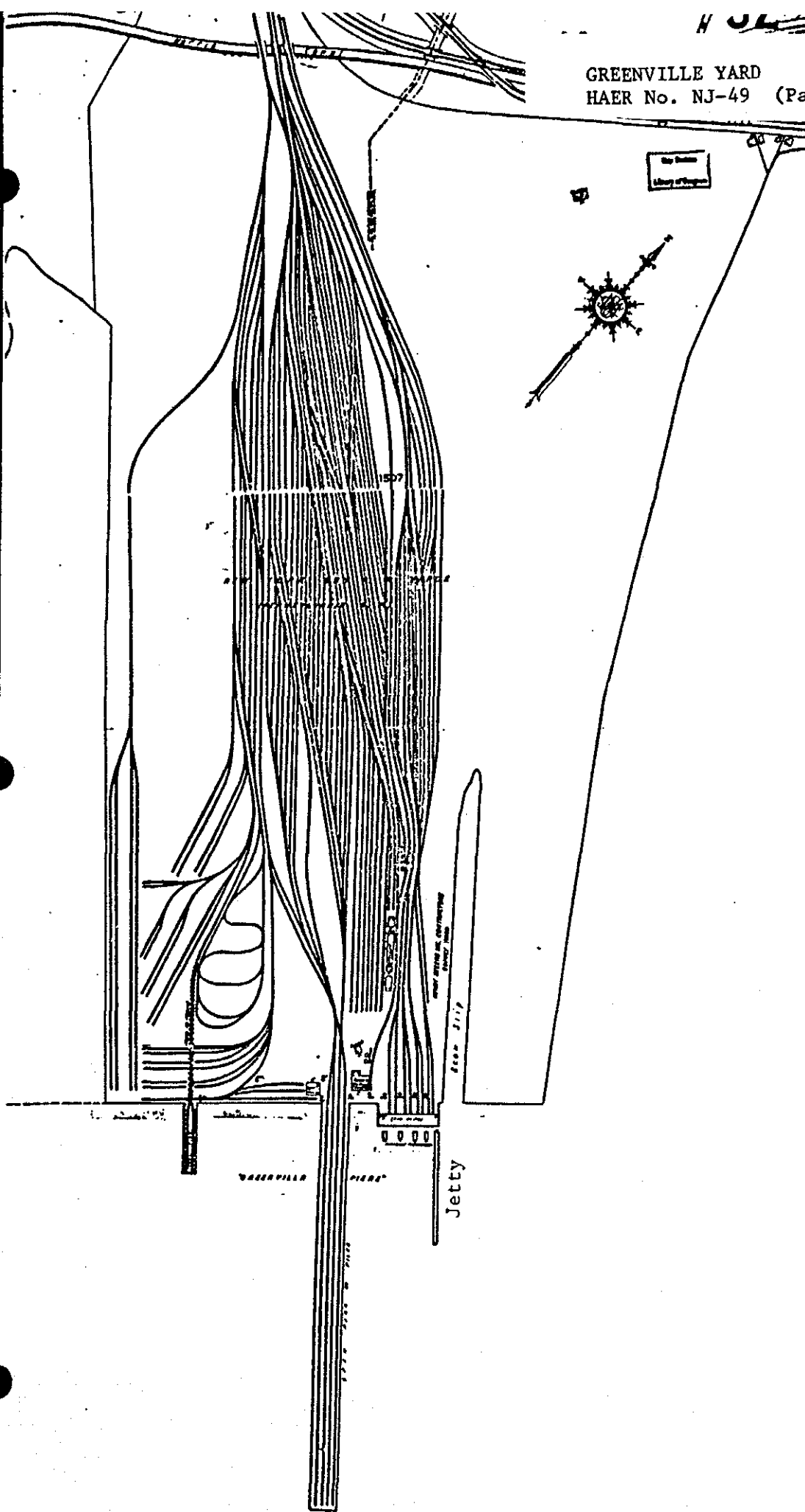


FIGURE 5

1912 - GREENVILLE SHORELINE
Sanborn Co., Vol. 9: Index Sheet
from Jersey City Insurance Maps,



Detail of P.R.R. Greenville Yard in 1912,
reduced from Sanborn Map Co.: Jersey City
Insurance Maps, Vol.9: Sheet 92
Original scale 300 ft. = 1 in.

0 600 1200
scale in feet

GREENVILLE YARD
RECORDING & CULTURAL HISTORY
FIGURE 5a
HISTORIC SITES RESEARCH JAN.1983

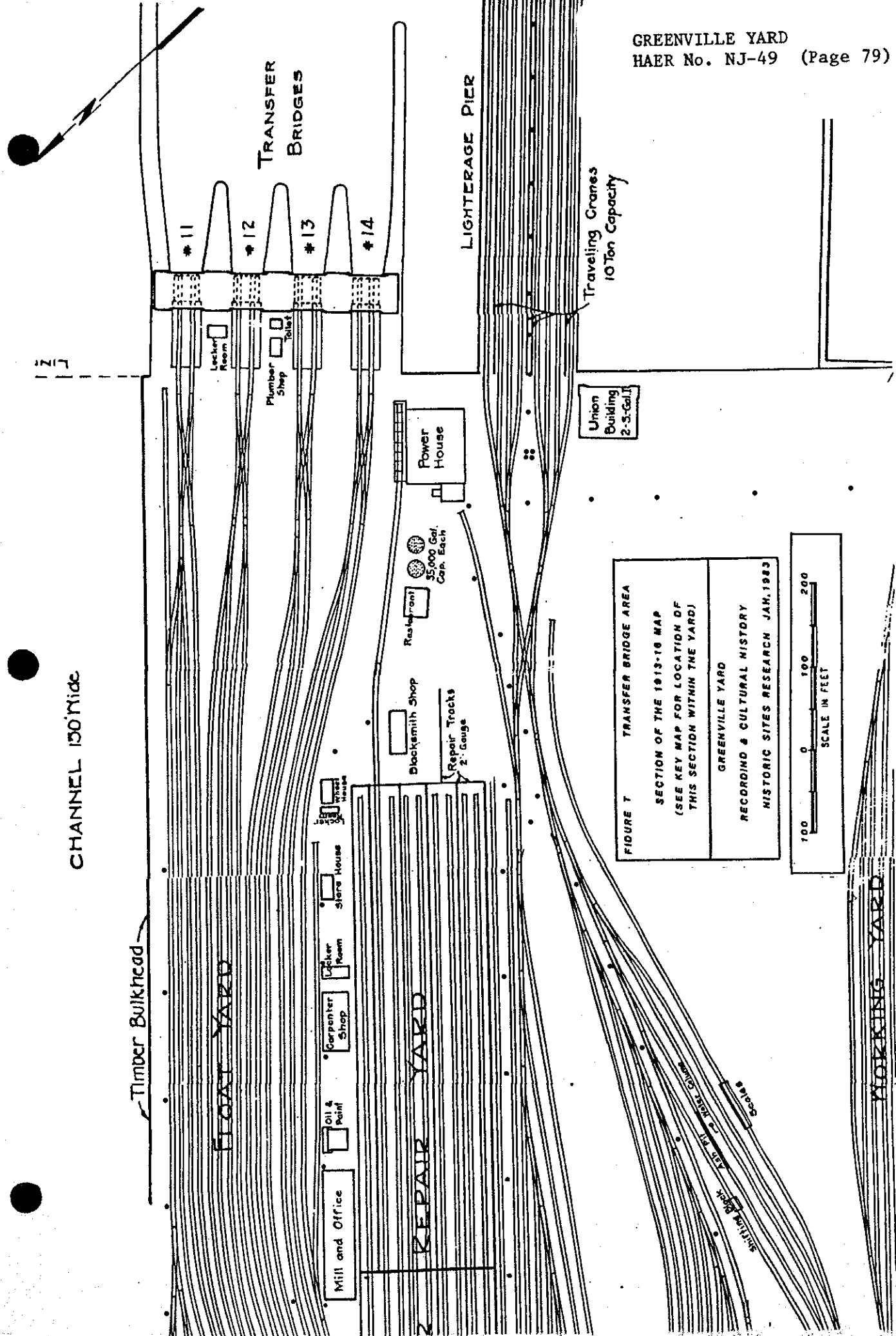
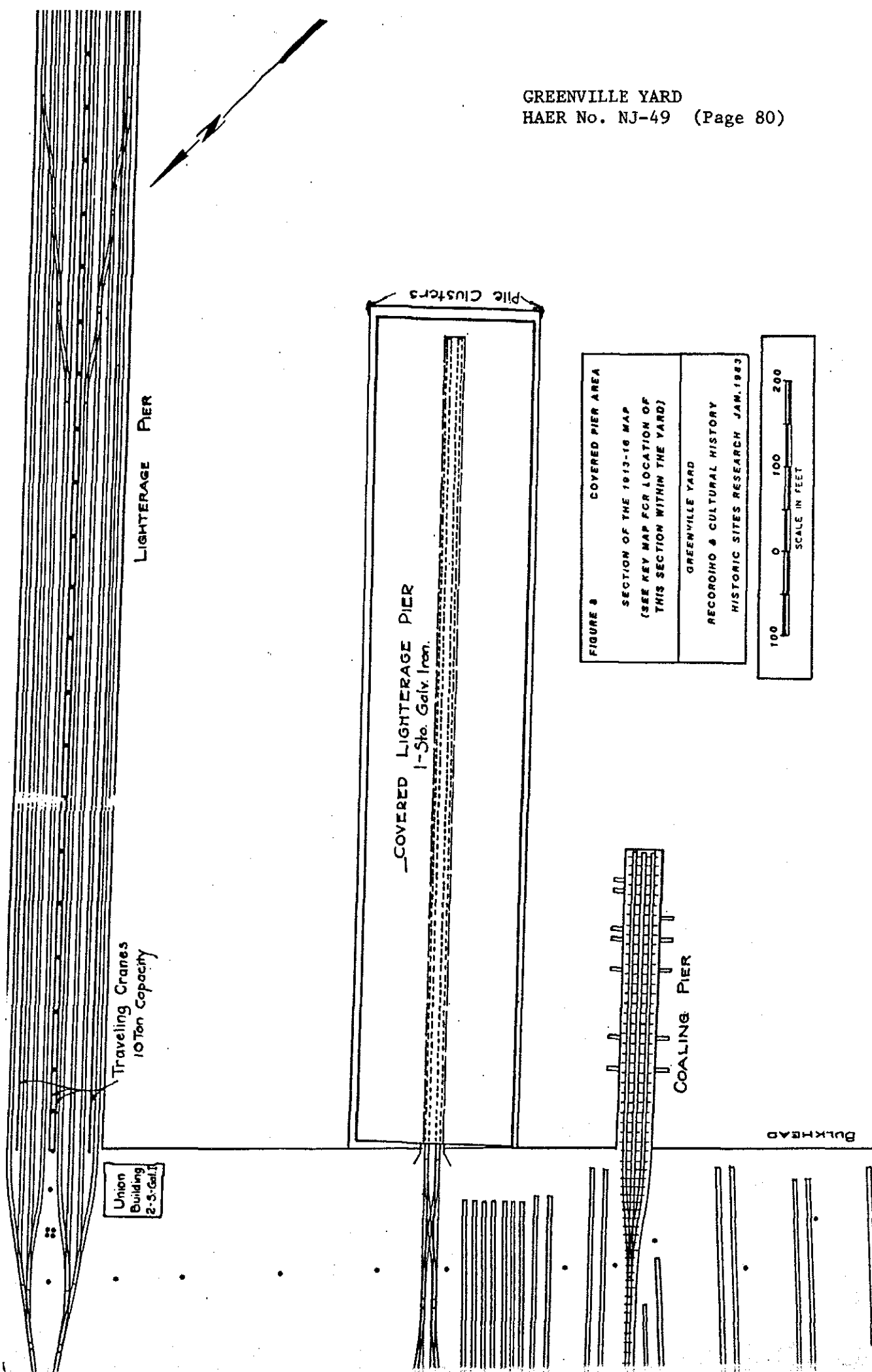


FIGURE 7 TRANSFER BRIDGE AREA
SECTION OF THE 1913-18 MAP
(SEE KEY MAP FOR LOCATION OF
THIS SECTION WITHIN THE YARD)

GREENVILLE YARD
RECORDING & CULTURAL HISTORY
HISTORIC SITES RESEARCH JAN. 1983

FIGURE 8 COVERED PIER AREA
SECTION OF THE 1913-16 MAP
(SEE KEY MAP FOR LOCATION OF
THIS SECTION WITHIN THE YARD)

GREENVILLE YARD
RECORDING & CULTURAL HISTORY
HISTORIC SITES RESEARCH JAN. 1983



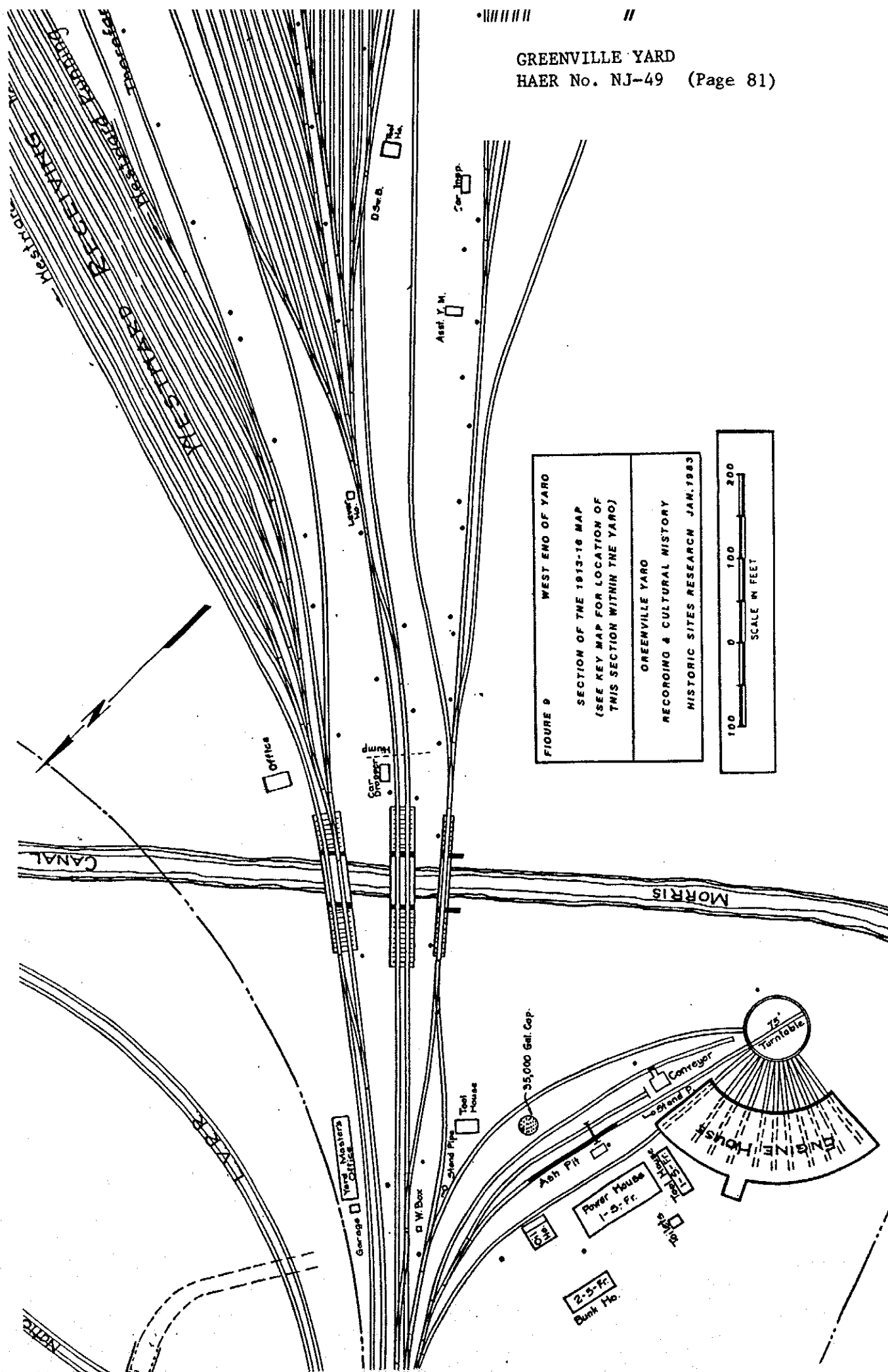
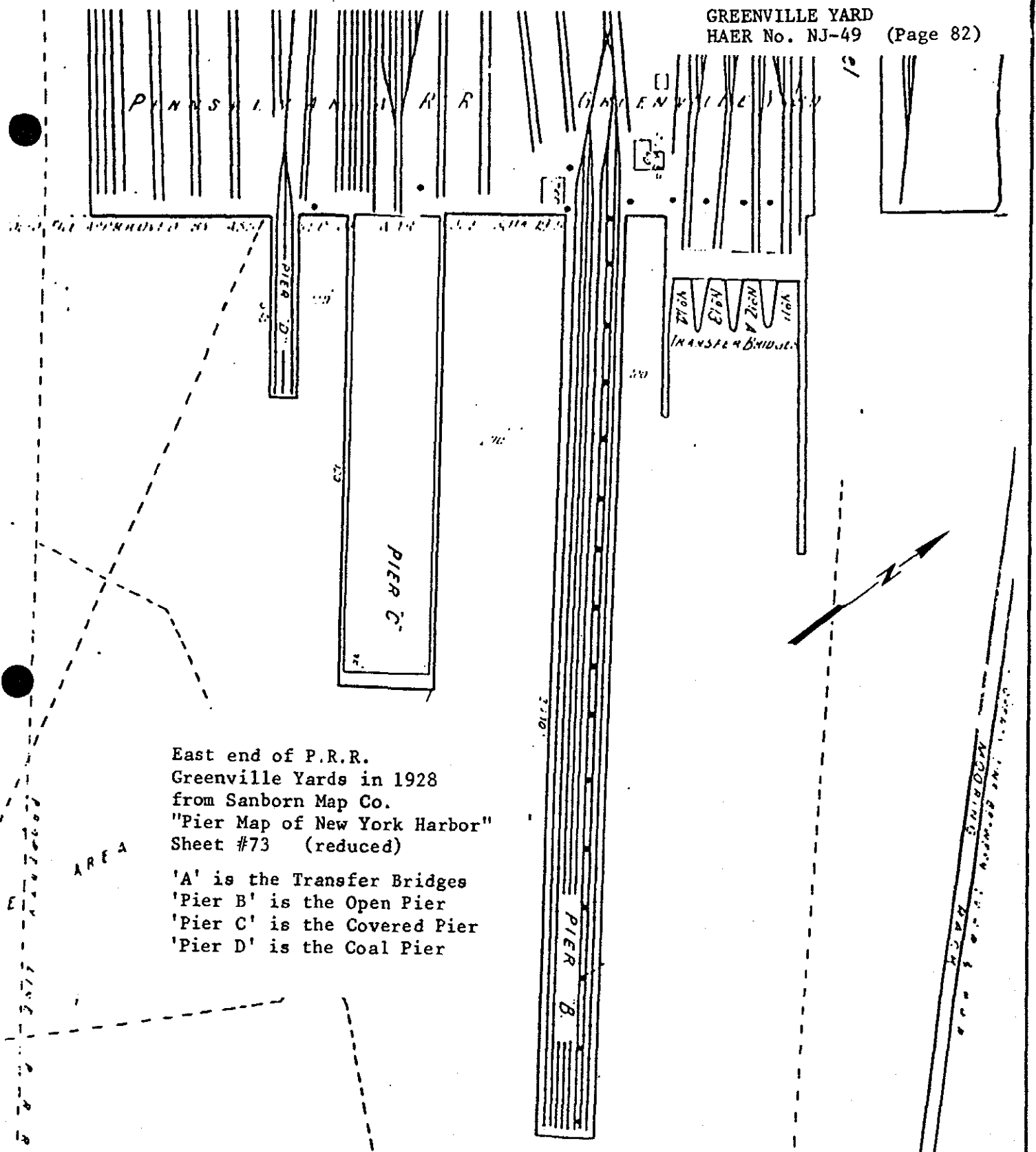


FIGURE 9 WEST END OF YARD
SECTION OF THE 1913-16 MAP
(SEE KEY MAP FOR LOCATION OF
THIS SECTION WITHIN THE YARD)
GREENVILLE YARD
RECORDING & CULTURAL HISTORY
HISTORIC SITES RESEARCH JAN. 1983





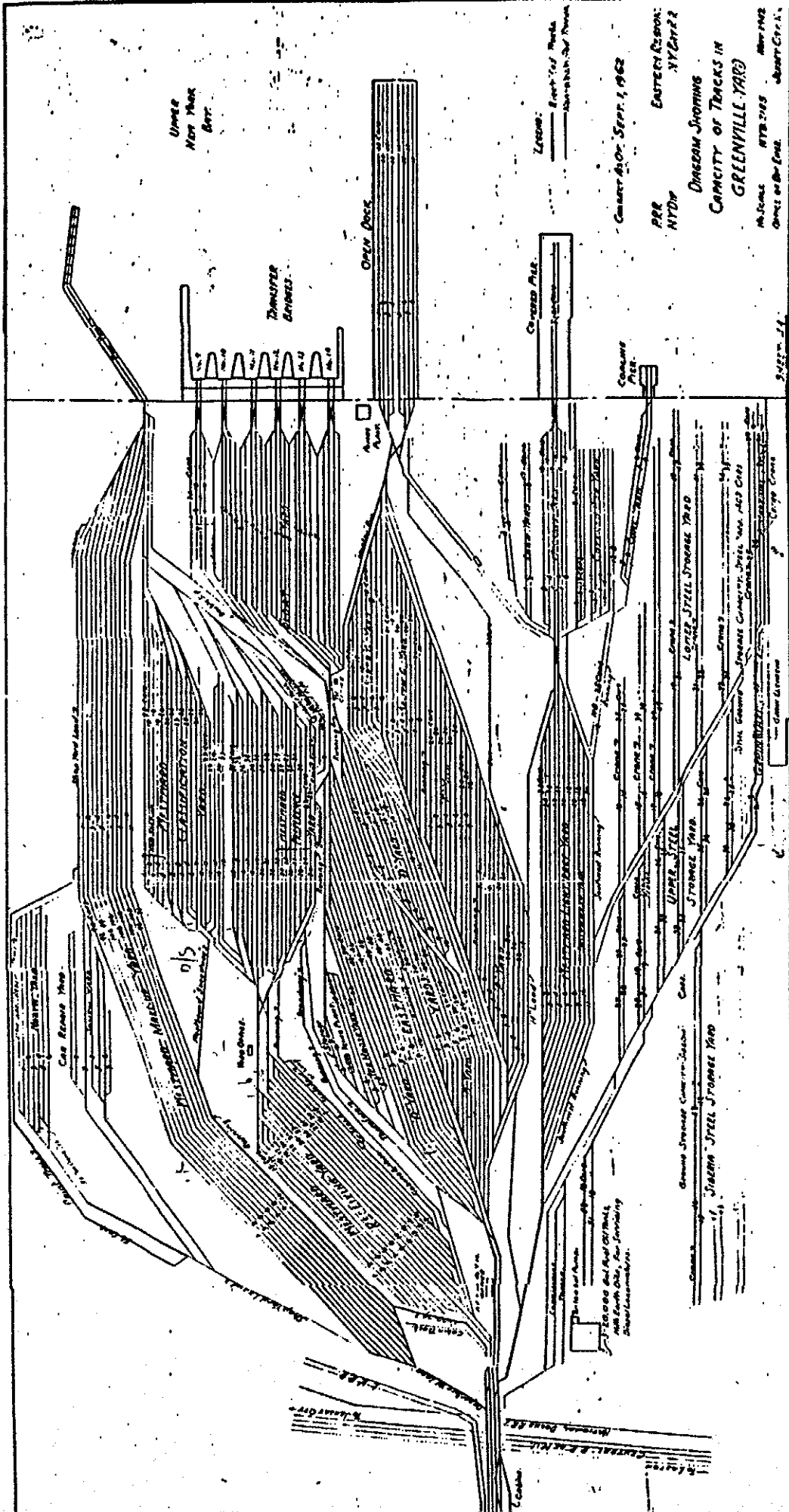
East end of P.R.R.
Greenville Yards in 1928
from Sanborn Map Co.
"Pier Map of New York Harbor"
Sheet #73 (reduced)
'A' is the Transfer Bridges
'B' is the Open Pier
'C' is the Covered Pier
'D' is the Coal Pier

1928 - PIER MAP OF NEW YORK HARBOR

0 330 660
scale in feet

GREENVILLE YARD
RECORDING & CULTURAL HISTORY
FIGURE 12

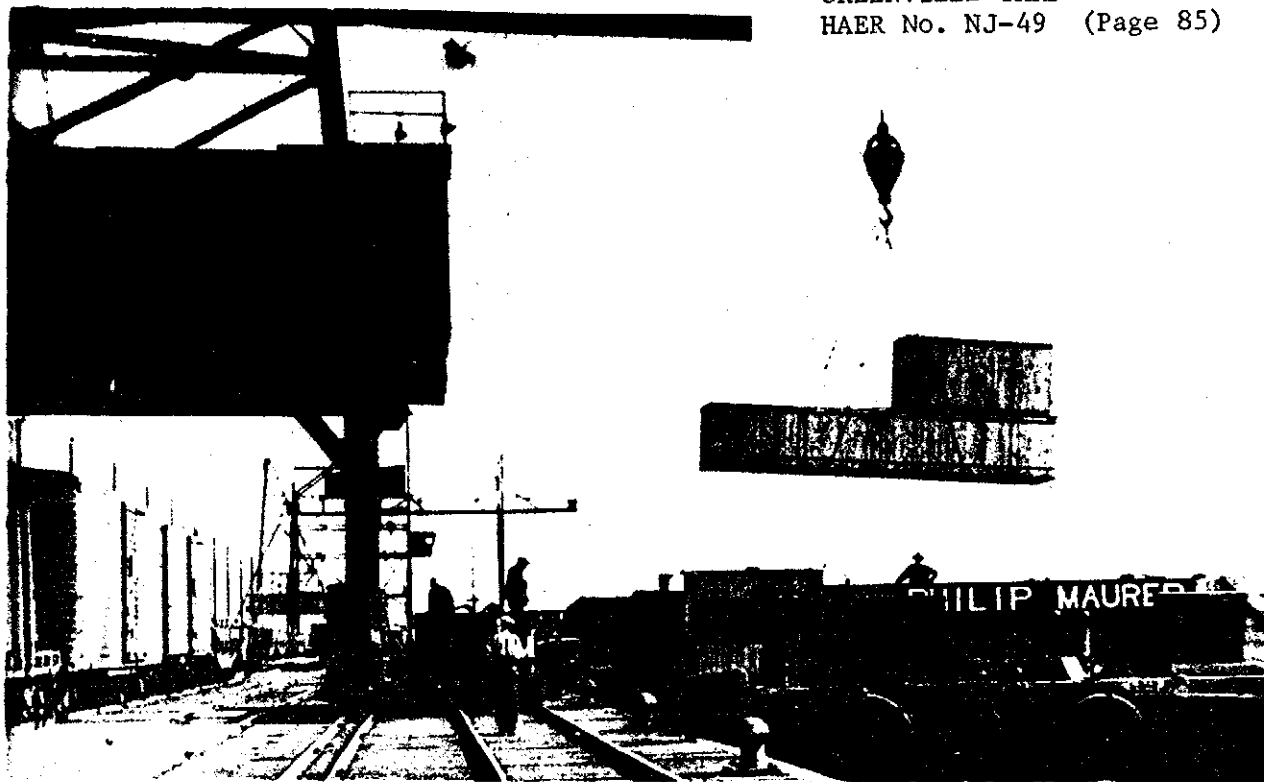
HISTORIC SITES RESEARCH JAN. 1983



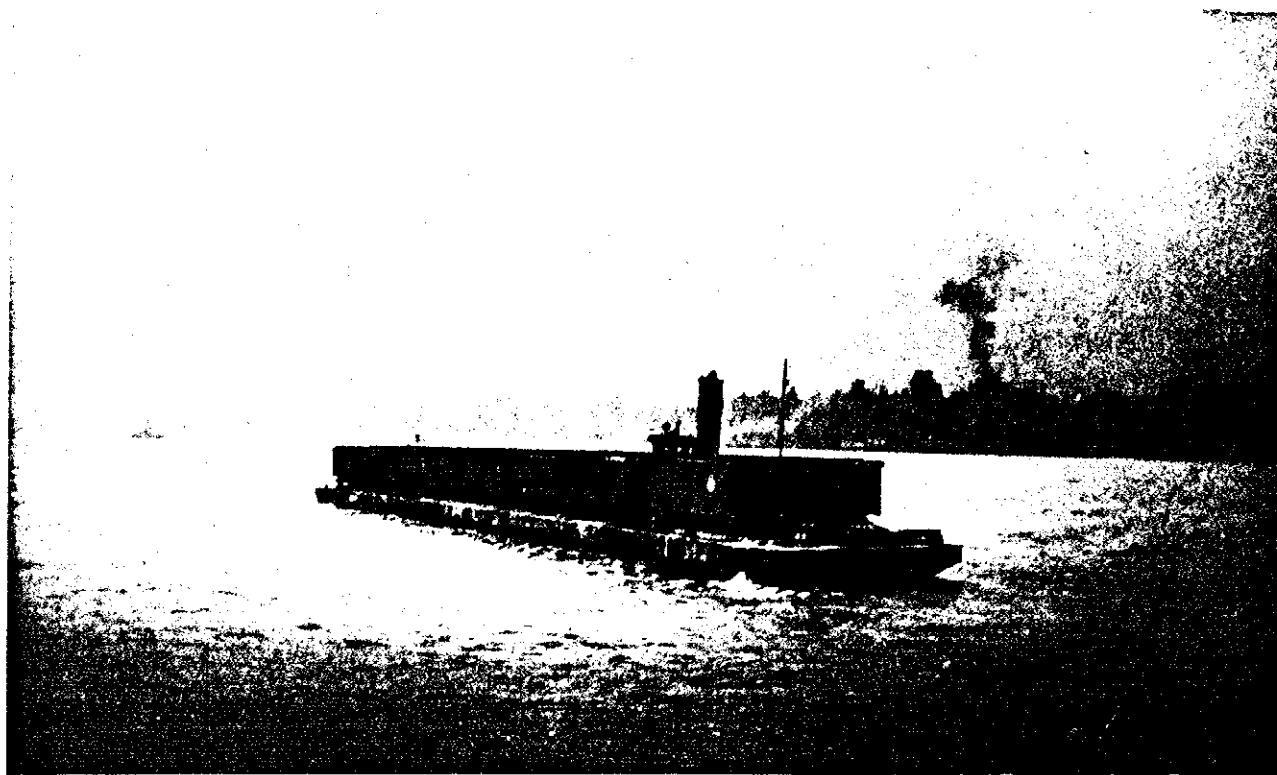
GREENVILLE YARD
RECORDING & CULTURAL HISTORY
FIGURE 14
HISTORIC SITES RESEARCH JAN. 1982

APPENDIX 4:

COPIES OF FIELD PHOTOGRAPHS



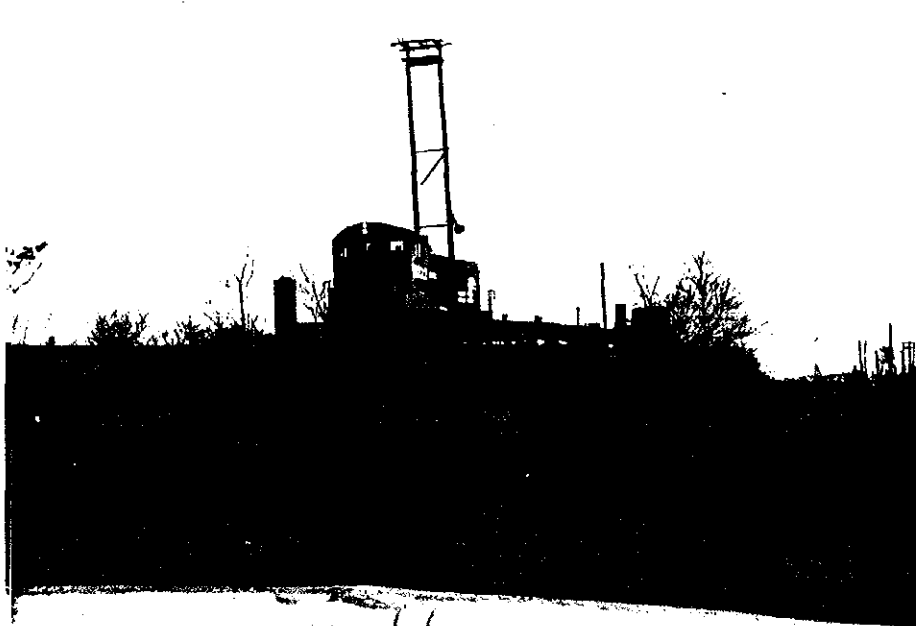
Crane No. 3 on the Open Pier loading off Track 8 onto a Lighter. Crane No. 4 is visible behind it. The tip of the Covered Pier is visible at the far right. (Historic View published in 1949 by G.W. O'Conner page 77).



A typical Car Float being pushed by a tug. This is part of the fleet of the N.Y. Central Railroad which was merged with the Pennsylvania Railroad in 1968. (Historic View published in 1949 by G.W. O'Conner, page 88).



View looking northeast from the Eastbound Hump, at the head of the yard (west end), showing part of the Eastward Yard ("A" Yard) and remnant of Westward Receiving Yard. The Statue of Liberty is visible in the center of the photograph, beyond piles of scrap steel covering part of the old Claremont Yard of the Lehigh Valley Railroad. Buildings of lower Manhattan are at the extreme left.



Conrail Switch Engine on the Eastbound Hump, handling freight cars for the New York Dock Railway. View faces east.

PHOTOGRAPHIC PLATES

GREENVILLE YARD
RECORDING & CULTURAL HISTORY

HISTORIC SITES RESEARCH JAN. 1983



The Icing Plant Platform in the Ice House Yard. The rails have been removed in this yard and many ties are strewn about. View faces north.

PHOTOGRAPHIC PLATES

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Panorama from the Yard Office toward the six Car Float Transfer Bridges (on left), Open and Covered Piers and Coaling Station (on right). These structures are built along the eastern bulkhead of the Greenville Yard. Note the tall modern rigging cranes docked between the Open and Covered Pier, and between the Covered Pier and the Coaling Station. View faces east to southeast.

GREENVILLE YARD

RECORDING & CULTURAL HISTORY

PHOTOGRAPHIC PLATES

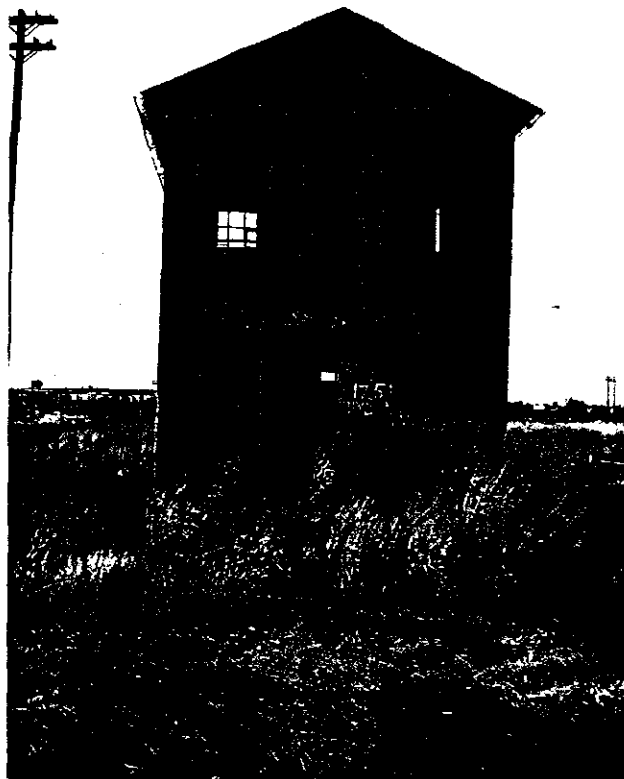


Yard Office at the intersection between Eastward Yards, "D" Yards, and Float Yard. This controlled switching going onto the Car Float Transfer Bridges. The Transfer Bridges are seen in the distance, to the right, and the Hunt Tower Cranes are at the far right. View faces southeast.

PHOTOGRAPHIC PLATES

GREENVILLE YARD
RECORDING & CULTURAL HISTORY

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Detail of the Yard Office (above). View faces northwest.

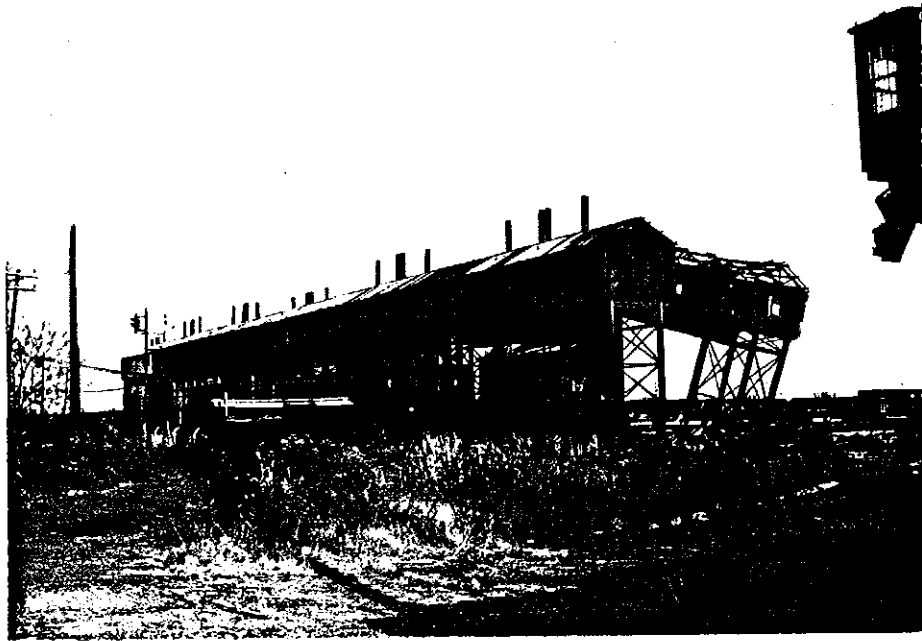
PHOTOGRAPHIC PLATES

GREENVILLE YARD
RECORDING & CULTURAL HISTORY

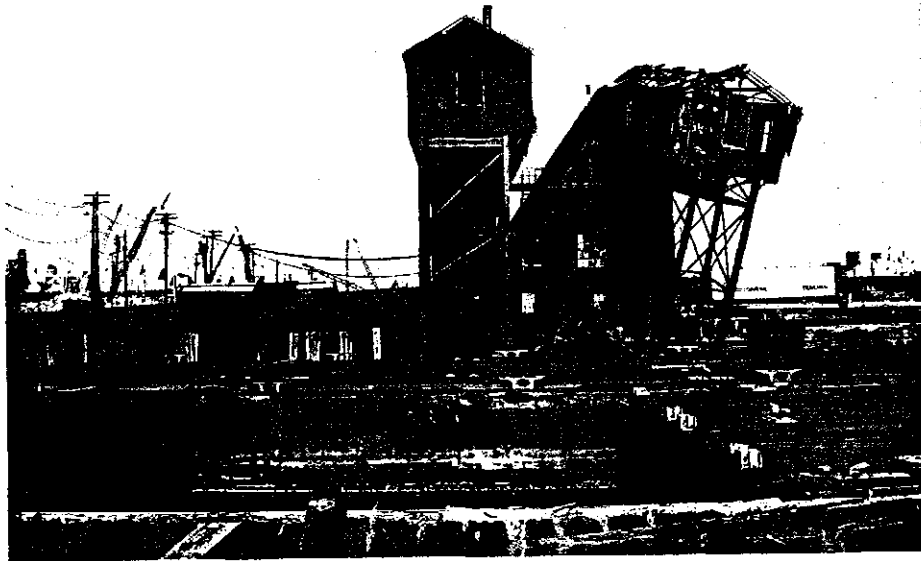
HISTORIC SITES RESEARCH JAN. 1983



View from the Yard Office across the northwest portion of the yards, toward the neighborhood of Greenville, in Jersey City. View faces northwest.



The six Car Float Transfer Bridges as seen from the Power House. The only two operational bridges are Nos.11 and 12, at the center. Part of the engine house of Crane No.1 on the Open Pier is seen at upper right. View faces northeast.

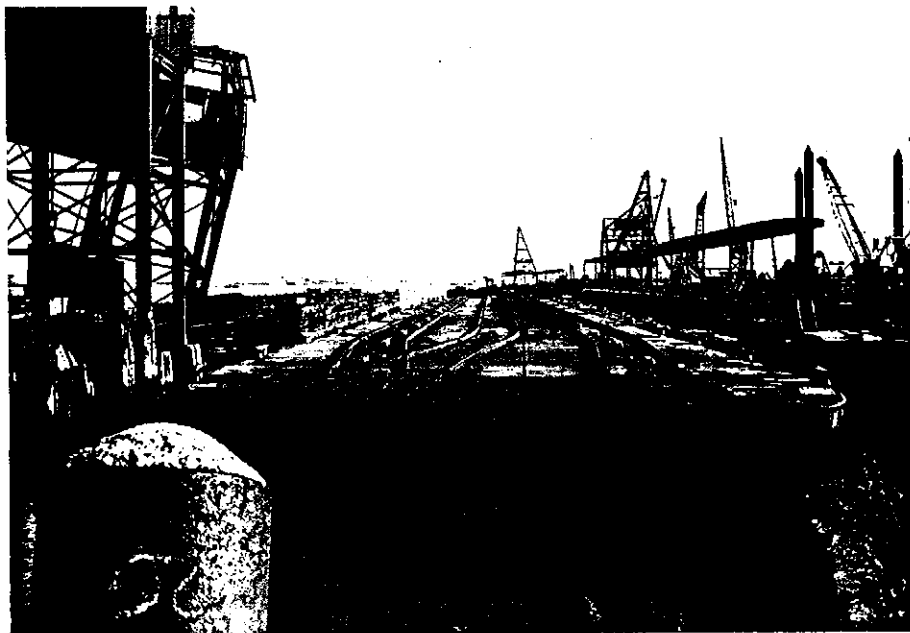


A view of the superstructure of the Car Float Transfer Bridges from the Open Pier. The superstructure over Transfer Bridge No.14 , at the southwest end of the set, is collapsing. In the foreground is part of the Open Pier, and two empty car floats moored between it and the Transfer Bridges. View faces northeast.

PHOTOGRAPHIC PLATES

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A car float scow docked adjacent to Car Float Transfer Bridge No.14. This is an open or "Interchange Float". To the right is a "Station Float", with a covered Freight Platform running down the center. The Open Pier is at the far right. The collapsing superstructure of Bridge No.14 is shown at upper left. View faces southeast.



A loaded car float scow that is docked at the Transfer Bridges. The bridge apron shows in the immediate foreground, but has not been lowered to the scow. View faces southeast.

PHOTOGRAPHIC PLATES

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Power House (built ca. 1904-05, burned in 1972 or 1973), supplied power for Car Float Transfer Bridges, Gantry Cranes on the open pier and other aspects of lighterage and yard operation. View faces northeast.

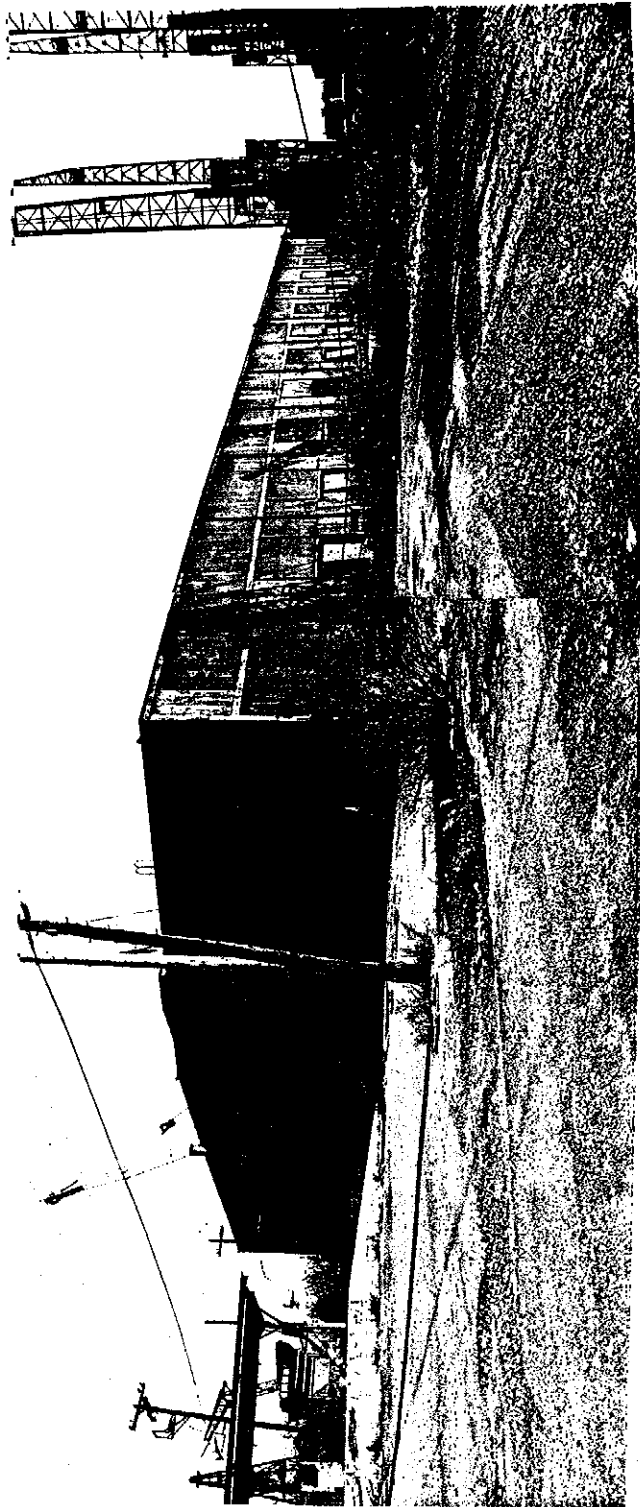


Power House as seen from the Open Pier. Part of Hunt Tower Crane No.1 is seen at left on the pier. View faces northwest.

PHOTOGRAPHIC PLATES

GREENVILLE YARD
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The Covered Lighterage Pier as seen from the Covered Pier Yards. The structure at the far left is the Covered Transfer Platform, built after 1943 for use by trucks. The structures at the far left are the modern marine rigging cranes which are docked at the bulkhead. View faces southeast.

PHOTOGRAPHIC PLATES

GREENVILLE YARD

RECORDING & CULTURAL HISTORY

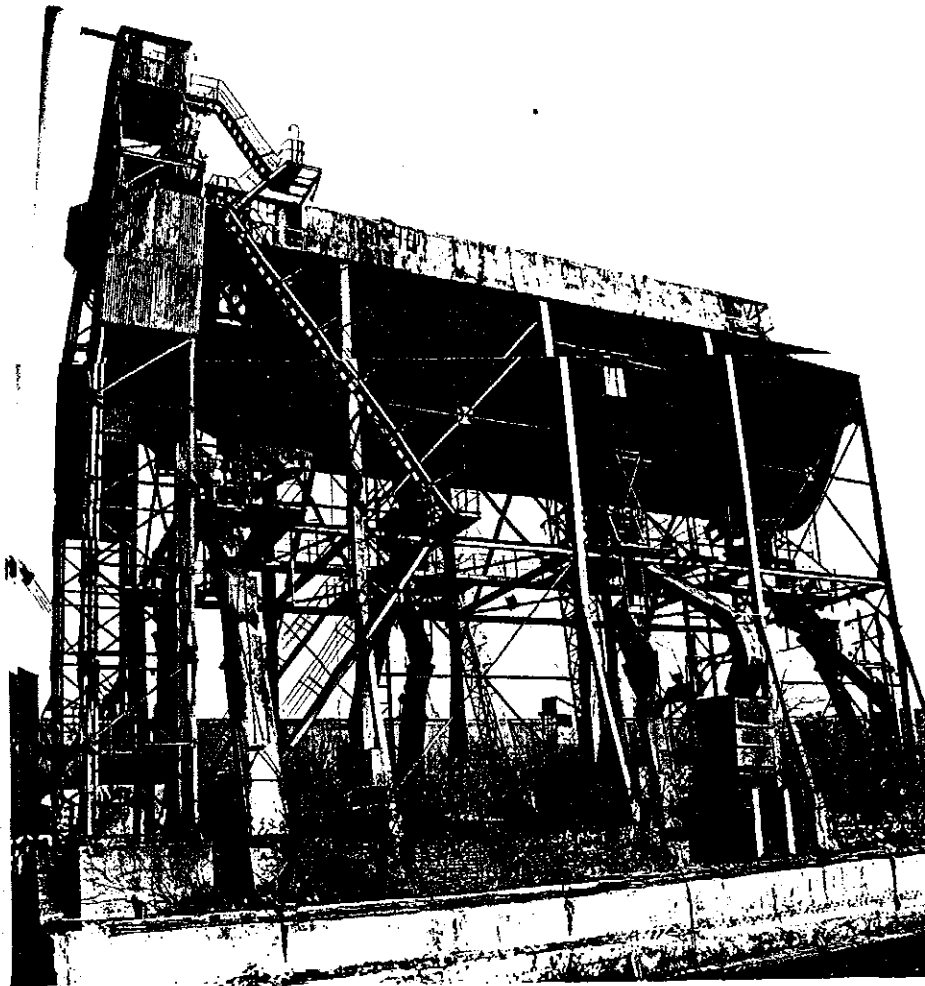


The 680 Ton Steel Coaling Station, built about 1940, as seen from the Greenville Yard eastern bulkhead. The pilings which supported the tracks leading to the hopper are seen in the foreground. The modern rigging crane at far left is docked between the coaling station and the covered pier. The two open frameworks on each side which converge at the top, held conveyors which carried coal up to the hopper. View faces southeast.

PHOTOGRAPHIC PLATES

GREENVILLE YARD
RECORDING & CULTURAL HISTORY

HISTORIC SITES RESEARCH JAN. 1983

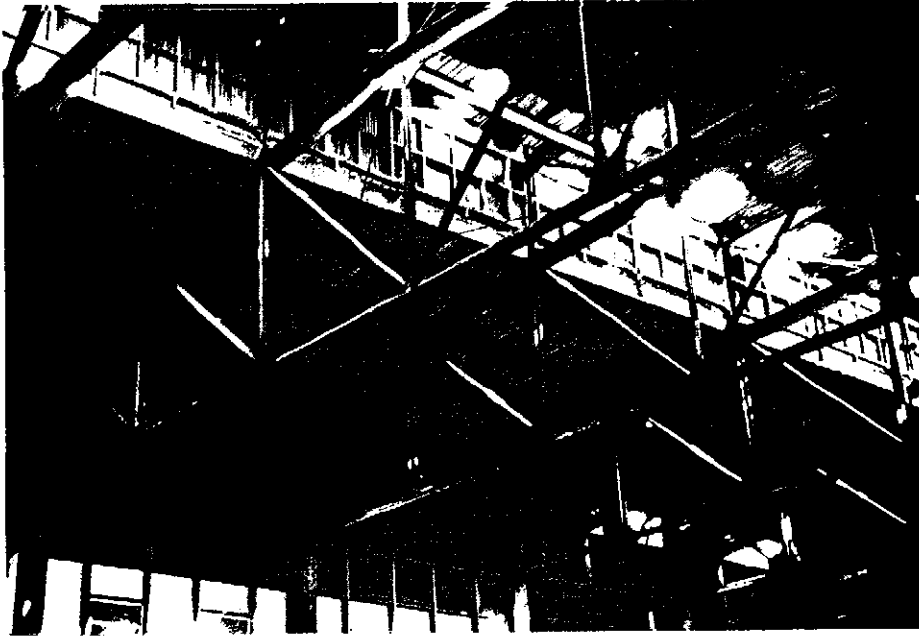


Composite view of the Coaling Station from the southeastern corner of the bulkhead. This view shows detail of the staging and hopper. View faces northeast.

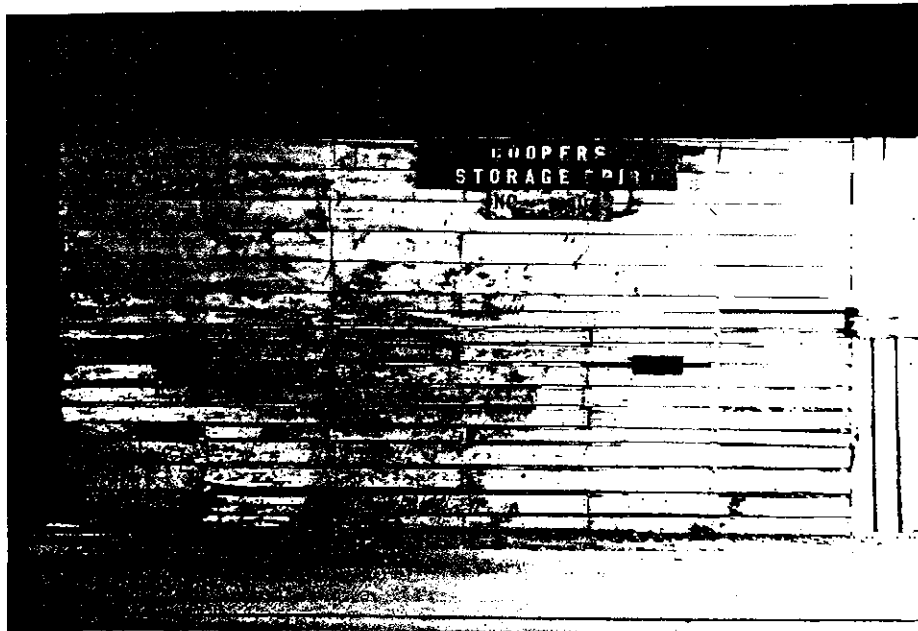
PHOTOGRAPHIC PLATES

GREENVILLE YARD
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HISTORIC SITES RESEARCH JAN. 1983



An interior view of the Covered Pier showing detail of the ceiling structure above the office area and the space created by the clerestory. The top of the two-story office built in 1942 is visible at lower left. View faces east.



The Cooper's Storage Crib, at the southwest corner inside the Covered Pier. This is typical of small service structures which existed at the Greenville Yard. It held material for boxing or crating cargo, and for repairing such "dunnage". View faces southwest.

PHOTOGRAPHIC PLATES

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The "Marginal" or "Whirly" 40 Ton Crane on the south edge of the Greenville Yard. This crane was moved here in 1942 - 43. The large modern warehouse in the background is just south of the Greenville Yard. View faces west.

PHOTOGRAPHIC PLATES

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Composite detail view of the 40 Ton Crane showing the top of the derrick or framework on which it rests, the power house, raised control cab, crow's nest, and boom. View faces west.

PHOTOGRAPHIC PLATES

GREENVILLE YARD
RECORDING & CULTURAL HISTORY

HISTORIC SITES RESEARCH JAN. 1983

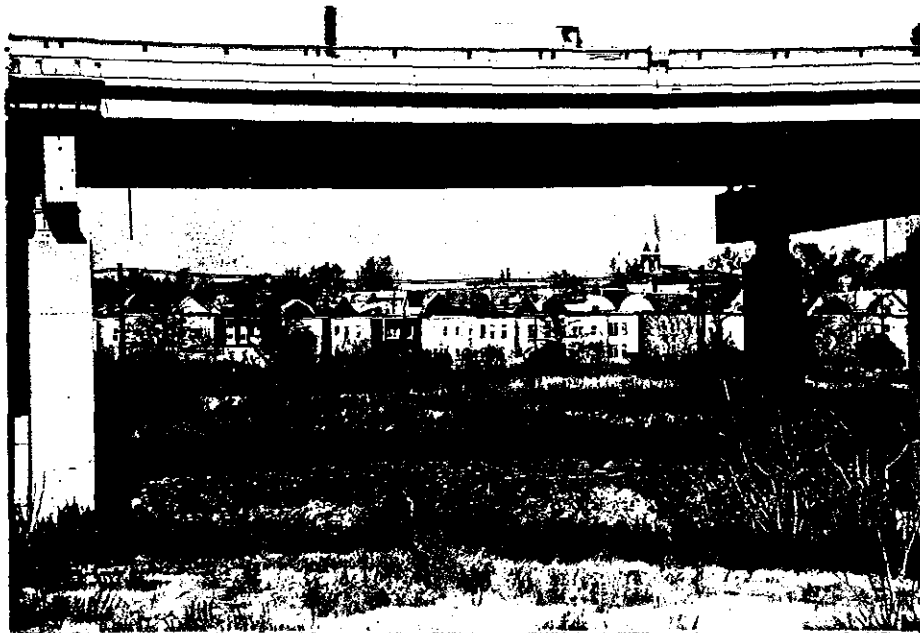


Composite detail view of the 40 Ton Crane showing the concrete foundation sleepers, derrick with rotating ring on top, rear of the power house, stays, crow's nest at top, and the boom leaning away from the camera. View faces east.

PHOTOGRAPHIC PLATES

GREENVILLE YARD
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The community of Greenville (southern end of Jersey City), viewed through piers of the New Jersey Turnpike, from the Yardmaster's Office, at the west end of the Greenville Yard. This shows the nearest approach of part of the yard to the residential area. The Morris Canal, now filled in, ran parallel to the Turnpike here. View faces northwest.

PHOTOGRAPHIC PLATES

GREENVILLE YARD
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HISTORIC SITES RESEARCH JAN. 1983